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The building of a value based chain

- Case study of a global, FSC- and Fairtrade certified
sawn wood value chain

Frida Magnusson



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**The building of a value based chain
– Case study of a global, FSC- and Fairtrade certified sawn wood value chain**

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Summary

The next frontier of value creation for businesses may lie in finding ways to combine economical, social and environmental sustainability to preserve and protect natural resources. Nowadays, incorporation of sustainability values in core operations is not only seen as a part of sustainable development, but also as a successful strategy for companies. This is especially critical for the forest sector, as it is dealing with one of the Earth's most crucial natural resources. However, creating new kinds of value chains and business models to achieve systemwide value, have shown to be complicated. Much work remains in an effort to explain how value based forest products chains can be structured and managed in order to successfully connect them to global markets, while at the same time maintain that sustainability values are met. This especially concerns value based, small-scale sawn wood chains, which have gained very little attention in business management literature.

The aim of this study is to explain the development of a small-scale, value based sawn wood value chain. This is done by focusing on enabling factors, which can explain the functioning of the value chain. To reach the aim, a case study has been carried out on a Forest Stewardship Council- and Fairtrade certified sawn wood value chain, originating from forest owners in Chile and reaching secondary manufacturers in Sweden. A field study was performed in Chile during fall 2014 and a flexible method has been used. The conceptual framework of the study consists of value chain theory, sustainable supply chain management and sustainable partnership theory.

Empirical results show that the value chain structure and business model of the Curacautín value chain are closely related to each other. Relatively few stakeholders are involved in the studied stages of the chain. The chain is of a relational governance type, where trust and personal relations govern complex transactions. The sustainability attributes of the wood products, as well as the stakeholders' engagement to sustainability values, are perceived as strong enabling factors for the functioning of the chain, by interviewed respondents. However, lack of demand and low production capacity are perceived as constraints. The structure of the value chain differs from previous studied sawn wood value chains, by the relational governance, a more market-oriented focus and a shorter value chain.

Considering the intangible nature of the unique attributes of the wood products as well as the chain; the findings show that integration and two-way communication should be critical for the chain. Thus, it is critical that all stakeholders in the chain can "tell the story behind the wood"; to transmit the brand's sustainability attributes. Also, that the structure of the chain sustains the sustainability attributes all along the chain. In contrast to previous theory, this study suggests that not only marketing but also procurement and certification processes should be seen as key primary activities in the value chain, creating the unique value added attributes. In addition to the elements that are suggested as critical for sustainable partnerships according to previous literature, findings in this study indicate that also mutual sustainability values appear to explain collaborations. The mutual sustainability values appear to imply patience, which should be critical considering numerous challenges. In the short term, the stakeholders might perceive that their engagement brings benefits such as communication of a sustainability engagement and/or risk reduction related to sourcing. In the long term, the stakeholders appear to engage due to a perceived responsibility and an intention to try to have an impact on the political order in society.

Resumen

Crear modelos de negocio y cadenas de valor que además de crear valor económico pueden preservar y proteger los recursos naturales se sugiere como una nueva frontera en la creación de valor para empresas. La incorporación de los valores de sostenibilidad en las operaciones centrales de una empresa es visto no solo como parte del desarrollo sostenible sino también como un requisito previo para el futuro de la propia empresa. Para el sector forestal, esto es especialmente relevante, ya que se trata de uno de los recursos naturales más importantes de la Tierra y cuenta con la alta influencia de las partes interesadas. Sin embargo, queda mucho trabajo para explicar cómo cadenas de productos forestales, con una base valor, pueden ser estructuradas y gestionadas para conectar a mercados globales a la vez que cumplen con los valores para la sostenibilidad. Concretamente, esto hace referencia a cadenas de madera aserrada a pequeña escala, con una base de valor, que han ganado muy poca atención en la literatura de gestión empresarial.

El objetivo de este trabajo es explicar el desarrollo de una pequeña cadena de madera aserrada a nivel global, basada en valores sostenibles. Esto se realizó centrándose en factores que pueden explicar el funcionamiento de la cadena de valor, para conectar al mercado global. Para alcanzar este objetivo, se ha llevado a cabo el estudio de un caso de una cadena de valor de madera aserrada, de Chile a Suecia. Esta cadena de valor es en pequeña escala y certificada por los estándares de Comercio Justo y Forest Stewardship Council. Se llevó a cabo un estudio de campo en Chile con un método flexible. Como marco teórico, la teoría de cadena de valor, gestión de suministro sostenible y teoría de colaboración sostenible fueron usadas.

El resultado empírico muestra que la estructura de la cadena y el modelo de negocio para la cadena de valor de Curacautín, están fuertemente relacionados. En las etapas de la cadena que están incluidas en este estudio, relativamente pocas partes están involucradas. La gobernanza de la cadena puede explicarse como una gobernanza relacional. Los valores de la sostenibilidad de la madera aserrada, así como el compromiso de las partes interesadas en estos valores, son factores que favorecen el funcionamiento de la cadena, según los entrevistados en el estudio del caso. Sin embargo, la falta de demanda y la falta de instalaciones de producción son algunos de los desafíos percibidos. La estructura de la cadena difiere de las anteriores cadenas de madera aserrada estudiadas por la gobernanza relacional, por ser una cadena mas corta y por tener una orientación de mercado.

Considerando el carácter intangible de los atributos únicos de la cadena y los productos; los resultados muestran que la integración y la comunicación de doble sentido son críticos para la cadena. Por lo tanto, es fundamental que todos los actores de la cadena puedan "contar la historia que hay detrás de la madera"; para transmitir los atributos de sostenibilidad de la marca. Además, que la estructura de la cadena sostiene los atributos de sostenibilidad a lo largo de ella. En contraste con teorías anteriores, este estudio sugiere que no solo el marketing sino también la adquisición y certificación deben ser vistos como actividades primarias, creando el atributo único del valor añadido. A mayores de los elementos que la literatura anterior sugiere como críticos para asociaciones sostenibles, este estudio indica que los valores mutuos de sostenibilidad parecen explicar colaboraciones. Los valores mutuos de sostenibilidad parecen implicar paciencia, lo que debería ser crítico en vista de los numerosos desafíos. En el corto plazo, las partes pueden percibir que su participación aporta beneficios como comunicación de un compromiso de sostenibilidad. A largo plazo, los actores parecen participar debido a una percibida responsabilidad y la intención de tratar de tener un impacto en el orden político en la sociedad.

Sammanfattning

Att konstruera affärsmodeller och värdekedjor som kan bevara och skydda naturresurser, samtidigt som de skapar ekonomiskt värde, ses som ett viktigt, nästa steg för företag som vill nå en ny front inom värdeutveckling. Att införliva hållbarhetsvärden i kärnan av ett företag, ses som en framgångsfaktor. För skogssektorn är detta speciellt kritiskt, med tanke på hur viktig skogen är som naturresurs och det tryck som intressenter kan utöva över företag i skogssektorn. Dock återstår mycket arbete för att förklara hur värdebaserade kedjor av skogsprodukter är uppbyggda och förvaldade, samtidigt som hållbarhetsvärden skapas och bibehålls. Detta rör speciellt småskaliga värdebaserade kedjor, som hittills har uppmärksamats ytterst lite i företagsekonomisk litteratur.

Syftet med denna studie är att förklara utvecklingen av en småskalig, värdebaserad kedja med sågade trävaror. Detta görs genom identifiering av faktorer som kan förklara varför kedjan fungerar; hur en småskalig, värdebaserad kedja kan nå globala marknader. För att nå syftet har en fallstudie utförts på en global värdekedja med sågade trävaror som sträcker sig från Chile till Sverige och som är Forest Stewardship Council samt Fairtrade certifierad. En fältstudie genomfördes i Chile under hösten 2014 och en kvalitativ metod har använts. Som teoretiskt ramverk används värdekedjeteori, teori kring hållbarhetsbaserad försörjningskedjeförvaltning samt teori kring samarbeten för hållbar utveckling.

Resultatet visar att värdekedjestrukturen och affärsmodellen för kedjan är starkt sammankopplade med varandra. De studerade stegen i kedjan utgörs av relativt få intressenter och kedjan har en relationsbaserad styrning, där tillit och personliga relationer hanterar de komplexa transaktionerna i kedjan. Hållbarhetsattributen hos de sågade trävarorna, likväl som hållbarhetsengagemang hos nyckelintressenter i kedjan, uppfattas som kritiska framgångsfaktorer av inblandade huvudintressenter i kedjan. Dock upplever respondenterna att brist på efterfrågan samt låg produktionskapacitet är hinder för kedjans utveckling. Strukturen på denna kedja, skiljer sig från tidigare studerade kedjor av sågade trävaror genom den relationsbaserade styrningen, ett mer marknadsinriktat fokus och en kortare värdekedja.

Med tanke på den immateriella naturen hos hållbarhetsattributen i kedjan, visar denna studie att integration och tvåvägskommunikation bör vara av kritisk betydelse för kedjan. Detta innebär att en kritisk faktor är att alla inblandade intressenter i kedjan kan berätta ”historien bakom” de sågade trävarorna, för att förmedla varumärkets hållbarhetsattribut. Likaså att strukturen på kedjan hjälper till att upprätthålla de skapade hållbarhetsattributen längs med hela kedjan. Till skillnad från tidigare presenterad teori föreslår denna studie att inte bara marknadsföring utan även inköp av råvara samt certifieringsprocesser, ska ses som viktiga, primära aktiviteter i värdekedjan. Dessa aktiviteter förefaller bidra till att skapa de unika värdena. Utöver de faktorer som anses som kritiska för hållbara samarbeten enligt tidigare teori, indikerar resultatet i denna studie att även gemensamma, delade hållbarhetsvärden är viktiga, för att förklara samarbeten i kedjan. De ömsesidiga hållbarhetsvärdena förefaller innebära att intressenterna har ett relativt långsiktigt tålamod, vilket bör vara viktigt med tanke på de utmaningar som kedjan möter. På kort sikt kan intressenterna uppfatta att deras engagemang ger fördelar såsom bevis på hållbarhets-engagemang och/eller en minskning av inköps-relaterade risker. På lång sikt tycks huvudintressenterna välja att engagera sig för att de upplever att de har ett ansvar att försöka påverka den politiska ordningen i samhället, såsom att motverka avskogning och förbättra sociala villkor för små skogsägare i det globala Syd.

Abbreviations and acronyms

B2B	Business to business
BOP	Bottom of the pyramid
CLP	Chilean Pesos
CONAF	La Corporación Nacional Forestal/ National Forestry Corporation in Chile
CR	Corporate responsibility
CSR	Corporate social responsibility
DIY	Do it yourself
FAO	Food and Agriculture Organization of the United Nations
FLO	Fairtrade Labelling Organizations
FSC	Forest Stewardship Council
FT	Fair trade (referring to value chains with fair trade constructs)
FWC	Fair Wood Connection
MFS	Minor Field Study
NGO	Non governmental organization
PEFC	Programme for the Endorsement of Forest Certifications
SCM	Supply chain management
SD	Sustainable development
SFM	Sustainable forest management
SIDA	Swedish International Development Cooperation Agency
SLIMF	Small and low-intensity managed forest
SLU	Swedish University of Agricultural Sciences
SMEs	Small and medium sized enterprises
SMFEs	Small and medium sized forest enterprises
SSC A	SSC Americas
SSC WT	SSC Wood Technologies
USD	United States Dollar
VC	Vice chairman

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1 Introduction

This chapter presents the problem background, research problem, aim with research questions and delimitations. An outline of the thesis is also presented.

1.1 Problem background

"The next frontier of value creation for business, we believe, is to find ways to preserve and protect the natural commons while unleashing their vast untapped potential" (Nidumolu et al., 2014, 4).

The idea of sustainable development (SD) and sustainability, only get more and more topical in the societal discourse and also in the discourse of businesses (Arts *et al.*, 2010). With the notion of SD, businesses are seen as an important part in finding solutions that incorporate both social, environmental and economic sustainability (de Boer *et al.*, 2012; Elkington, 1999; UN, Internet, 1, 2014). Also, with the spread of information, dependence on supply networks, knowledge and expectations from internal and external stakeholders; sustainability has become a critical aspect of business management (Rainey, 2010). When moving into the future of business management, it is often stated that a successful strategy for a company is more than marketing; it is about implementing sustainability values in the company's core philosophies and operations (Elkington, 1999; Ottoman, 2011; Rainey, 2010). As Nidumolu *et al.* (2014, 4) state above in Harvard Business Review; the next frontier in value creation for businesses, may lie in finding ways to successfully combine business models and value chains with social, environmental and economical sustainability.

The forest industry is working with a natural resource that is concerned as one of the uttermost valuable and most critical to manage in a sustainable way – forests (Joshi, 2013, 2; World Bank, Internet, 1, 2014). Forests cover more than 30 % of the Earth's land area (FAO & JRC, 2012) and are believed to play a crucial role in mitigating climate change (UNEP, Internet, 1, 2014). They are the most bio diverse ecosystems on land (UNEP, Internet, 2, 2014) and the tropical forests alone, support 50 % of the Earth's terrestrial bio diversity (Nidumolu *et al.*, 2014, 4). Also, not to forget the range of resources and services that forests provide; food, fibre, building material, fuel, medicine, recreational services and freshwater, to mention some. There is an economical value of the forests that is estimated to 4 trillion USD annually (*ibid.*). Forests support more than 1.6 billion people directly (UNEP, Internet, 1, 2014) and the global trade in forest products was 421 billions USD in 2011 (FAO, Internet, 1, 2014).

However, more than one million hectares of forests are disappearing every month; due to deforestation and degradation (FAO, Internet, 2, 2014). Within a year, this sums up to more than 13 million hectares of forests (*ibid.*). This is a surface equal to almost 30 % of the Sweden's land area (Swedish Forest Agency, Internet, 1, 2014), disappearing every year. Lately, the rate of global deforestation shows some signs of decline, due to large-scale planting (FAO, Internet, 2, 2014). Nonetheless, the rate is *"still alarmingly high"* (FAO, Internet, 2, 2014; Hansen *et al.*, 2014).

In the focus of sustainability, there is an increasing body of literature in business management trying to explain how companies can reach new levels of value creation, by targeting sustainability and business management issues (Elkington, 1999; Nidumolu *et al.*, 2014; Rainey, 2010). However, for the forest industry there is still few literature that addresses development of more sustainability based business models and value creation built on

sustainability (Levall & Prejer, 2013; Li & Toppinen, 2011). Also, business management literature that concerns and analyses value creation and sustainability aspects, addressing small- and medium sized forest enterprises (**SMFEs**), seems to be almost non existent (Li & Toppinen, 2011, 121). Considering the fact that smallholders and communities manage as much as 30 % of the world's forests (FAO, Internet, 3, 2014), a successful, sustainable evolution of SMFEs is crucial for social, environmental and economical development (FAO, Internet, 3, 2014; FAO, Internet, 4, 2014; UNEP, Internet, 1, 2014).

1.2 Problem

Business management literature (Nidumolu *et al.*, 2014), organizations such as the World Bank and United Nations Environmental Programme (UNEP, Internet, 1, 2014; World Bank, Internet, 1, 2014), NGO's and business management practisers (pers. mes., Kaplan, 2014; pers. mes., Miranda, 2014); they all call for development towards business models and chains where it is possible to combine economical, social and environmental sustainability, to protect and preserve forests. If the economical value of sustainable forest management (**SFM**) is too low and opportunity costs are too high, land owners tend to switch to other types of land use (Van Dijk & Savenije, 2009). In the prolonging, this means that if the economical value of SFM is too low, forests are likely to get degraded or deforested (*ibid.*; pers. mes., Kaplan, 2014). If the forest owners get increased financial incentives for SFM in a value chain, incentives for SFM in the whole value chain will also be enhanced (Van Dijk & Savenije, 2009).

The question is how to structure and build a value chain in the forest sector, which successfully combines economical, social and environmental values; how to create a business that is profitable but also sustains and protects forests. While facing small-scale forest businesses, the question gets even more complicated; it is established that SMFEs face many challenges to survive in the long run and have problems to access global markets, already without a value based concept (Aoudji *et al.*, 2012; Donovan *et al.*, 2006; Tomaselli *et al.*, 2013; Wagner *et al.*, 2011). Furthermore, value based businesses, such as Fairtrade chains, are unable to compete with traditional product chains at certain issues (Karjalainen & Moxham, 2013).

In addition, the structure of global forest value chains and the forest industry in general, is exceedingly complex (Hansen *et al.*, 2014; Pulkki, 2001). Global trade networks are complex and hold many stages; complete chains can involve hundreds of individual companies (Taylor, 2005). Also, the forest industry has traditionally been characterized by a production orientation (Hansen *et al.*, 2014, 5). A low price, with highest possible quality, has been important to remain competitive (Pulkki, 2001). In addition, wood is a heterogeneous material with a lot of different characteristics (Schmulsky & Jones, 2011), which complicates the value chain processes further (Vahid & Maness, 2010).

Despite the significant share of forests that are managed by smallholders and communities and the potential of value creation in sustainable business models (Aoudji *et al.*, 2012; Nidumolu *et al.*, 2014), there are still few studies that address these issues. Li & Toppinen (2011, 121) state regarding corporate responsibility (**CR**) and small and medium-sized enterprises (**SMEs**):

"However, it is also worthy of note how little is known regarding CR in the context of small and medium-sized enterprises, which are also important actors in the forest industry sector in many countries". Developing sustainable businesses based on small-scale forestry can most likely be seen as one aspect of CR in the context of SMEs. Aoudji *et al.* (2012, 107) point out that *"Further researches are required to support decision making regarding the performance in farm-grown timber value chains".* Based on a literature review of the internationalization of the

forest products industry, Zhang *et al.* (2013, 8) argue that future internationalization research in the forest sector should focus on *"the multidimensional construct of sustainability and conduction analysis within broader geographic scope than has been done so far"*. The statements show that business management literature proves a need for research, that addresses the role of sustainability in the forest sector and in small-scale forest businesses. Karjalainen & Moxham (2013, 269) mean that the field of value/supply chain management has been slow to acknowledge fair trade (FT) contexts; *"much work remains to create a deeper understanding of how FT chains do—and should—operate"*. More research is required to ensure successful management of FT chains. Overall, implications of value/supply chain management, connected to value based products and organizations, has gained little focus in previous research (Pullman & Dillard, 2010). There is also a need for more value chain models in general, regarding forest products chains (Hughes *et al.*, 2014).

Since the latter half of the last decade, a value based, small-scale, sawn wood value chain from Curacautín in Chile to Sweden has been under development (pers. mes., Miranda, 2014; pers. mes., van Hensbergen, 2015). The idea behind the chain is to combine environmental and social sustainability with profitability; to create not only economical value but also promote SFM and increase the income for small forest owners (pers. mes., Miranda, 2014). The chain has met several challenges since the creation and is still producing in small volumes. However, this chain was one of the first chains with Forest Stewardship Council (FSC) and Fairtrade dual labelling, which succeeded to create a global, value based chain of sawn wood (van Hensbergen, 2013). It is also the only chain in a pilot project by FSC and Fairtrade, that resulted in a product permanently on the market for the duration of the pilot period (pers. mes., Dumas, 2014). Related to the empirical and theoretical problem described above, there is of interest to get answers about how a chain like this is structured and managed, how challenges stated in the problem formulation above might have been met and what factors that make the chain functioning (pers. mes., Kaplan, 2014; pers. mes., Dumas, 2014).

1.3 Aim

The aim of the study is to explain the development of a global, value based, small-scale sawn wood chain. This is done by focusing on identification of enabling factors, for the functioning of the value based sawn wood value chain; the ability to connect to global markets.

The following research questions are posed, in order to reach the aim:

- How is the value chain structured?
- What do the stakeholders in the chain perceive as critical factors for the functioning of the chain?
- How has the chain developed since the creation of the chain, with focus on collaborations?

The study is carried out as a case study of the FSC- and Fairtrade certified sawn wood value chain from Chile, which stretches from small forest owners and the company Fair Wood Connection in Curacautín, Chile, to Sweden.

1.4 Delimitations

There are a number of delimitations in this study. To start with, the study addresses specifically sawn wood, but no other kinds of forest products like fluff, pulp or non wood forest products

and services. Reasons to this are that timber is often the most important commercial product for local communities (Macqueen *et al.*, 2008, ix) and sawn wood might have the “*greatest prospects for improve trade relationships*” (Macqueen *et al.*, 2006, 8). Also, there is a demand for sawn wood with high environmental standards, amongst global retailers and traders (Macqueen *et al.*, 2008, 19).

Further, the empirical study does not focus on the retailer and consumer stage of the chain. The study is delimited to an investigation of the chain from the forestry stage, the sawmill stage and the further processing stage, see **figure 1**. Motives to this, are to be able to explain the management and critical factors for the first three stages deeper, as well as that no study yet has described or explained these stages by value chain theory¹. A drawback of the delimitation is that a wider system overview for the whole chain is not possible to achieve.

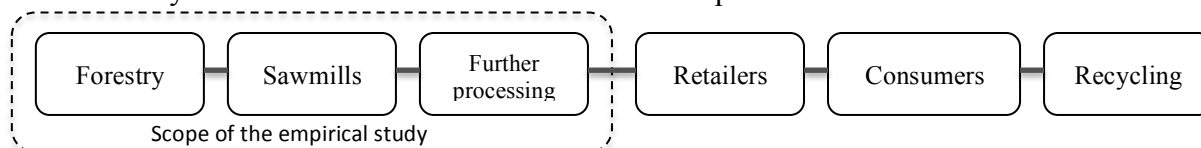


Figure 1. Delimited value chain stages of the case study.

The scope of the study is also delimited from more detailed explanations of production processes. An in-depth study of technical or marketing processes would certainly have value, but to keep the focus at an overall level of the chain in order to reach the aim, the study is delimited from that. Furthermore, the study is geographically delimited to Sweden and Chile. Factors that enable the chain are based on this context and the conclusions of which factors that enable such chain, will most likely differ in other contexts.

Regarding methodology delimitations; the field study is not longitudinal in time. Data collection was mainly carried out during fall 2014. The chain is developing, which means that many aspects might have changed since the data collection and that the result should be considered with awareness of this.

Theoretically, the theoretical framework does not include value chain distribution, financial analysis or assessment of sustainability. The framework is delimited to value chain structures and management. Explaining value chain structure and management is a fundamental step, which has to be addressed before explaining other factors in a value chain (van Dijk & Trienekens, 2013). An implication of the delimitation is that this study does not explain value chain distribution, which might be an enabling factor for the functioning of the chain. Also, the framework is delimited from theories, which focus on the institutional environment. Literature in Spanish is not included in the literature review, due to language barriers.

1.5 Outline

The thesis has the following structure: firstly, the method of the study is presented in chapter 2. In chapter 3, theoretical perspectives and previous research are presented. Chapter 4 concerns the result of the empirical study. An analysis of the empirical findings is offered in chapter 5. In chapter 6, the findings of the study is discussed and put into relation with previous theory and research. The conclusions of the study, with the purpose to address the aim, are presented in chapter 7. Appendices comprise among other things interview guides, prices of timber and sawn wood, information regarding the FSC- and Fairtrade pilot and photos.

¹ Ek's (2012) Master's Thesis investigated market aspects of the retailer and consumer stage regarding FSC- and Fairtrade sawn wood.

2 Method

This chapter explains the choice of the theoretical framework and research design. The method of data collection and quality assurance processes during the data collection are also presented. Further, a description is given of the choice and method of data analysis as well as ethical considerations. The chapter ends with a method discussion.

2.1 Choice of theoretical framework

The selection of the theoretical framework has been based on the aim and the research questions presented in chapter one. The first research question addresses how the chain is structured, with focus on the chain as an entity. Value chain theory has been selected because it goes beyond firm-specific analysis and includes an interlinkages perspective. Gereffi *et al.* (2006) and Kaplinsky & Morris (2003) mean that value chain analysis is especially useful for producers that are trying to enter new markets, which is the case for the case value chain. Also, it focuses on value adding processes (Hughes *et al.*, 2014), which can help explain the functioning of the chain. Additionally, the study concerns value based chains, framed by sustainability values. To specifically identify what enables sustainability attributes of a value based chain (Pullman & Dillard, 2010), the theoretical framework is complemented with the perspective of sustainable supply chain management (SCM). Further, the choice has been to identify and include reported critical factors for the functioning of value based value chains, in the framework. This is to create a comparative framework to the case study, but also to create a guide in the search for identification of enabling factors in the case study. The reason to include literature from more than one theoretical field, is to not lose a wider, system perspective. The identification of critical factors and the value chain theory, show that sustainable collaborations are a key factor, for the functioning of value based chains and for finding new solutions to challenges in such chains (Karjalainen & Moxham, 2013). Therefore, theory regarding sustainable partnerships is also included in the theoretical framework.

To solely focus on SCM theory, could have been an alternative for the theoretical framework. However, the belief is that this would not have enabled the same analysis of interlinkages and connections in the chain, which are important for the ability to connect to global markets (Kaplinsky & Morris, 2003). Agency theory has some relevance to the phenomenon of the study, but a critique against it is that it can not explain more value based relationships (van Dijk & Trienekens, 2012). To explain a sustainable development phenomenon, the chosen theoretical framework with interdisciplinary properties, appears more suitable.

2.2 Choice of research design

The aim of the study is to explain the development of a global, value based sawn wood chain, which is done by focusing on identification of enabling factors for the functioning of the value chain. To do so, an abductive theoretical reasoning has been used with a case study approach. The arguments for selecting this approach and design are presented below.

2.2.1 Abductive reasoning and flexible design

Starting with theoretical approaches, deductive respectively inductive approach are two common theoretical approaches in social sciences (Holme & Solvang, 1996). Hypothetical deductive method forms hypothesis from existing theory, which then are proven true or false by examining empirical data. Inductive approach starts from empirical data, to there on construct

theoretical concepts. Robson (2011) describes a third approach; the abductive reasoning, which cycles between deductive and inductive approaches. When dealing with open, real world systems, Robson (2011, 37) means that abductive reasoning “*appears to be particularly suited*” because of the possibility to adapt to changes. In this study, an abductive reasoning has been used. Arguments for this are that the phenomenon of interest takes place in an open system. There is a lack of literature and developed theoretical frameworks, which target the exact phenomenon. Therefore, deductive method did not seem suitable, in order to reach the aim. On the other hand, solely basing the study on inductive method would mean a loss of very valuable previous knowledge; a constraint that would imply that the result could not be taken equally far.

Research designs can be of qualitative, quantitative or mixed type (Holme & Solvang, 1996; Robson, 2011). Qualitative methods are characterized by explanation and a deeper understanding (Holme & Solvang, 1996; Robson, 2011). They contribute to a system perspective, enable a holistic analysis and allow closeness to the unit of analysis (Holme & Solvang, 1996). The qualitative method however implies that the result can not be generalized to explain characteristics of a bigger population. Quantitative methods on the other hand, allow generalization for a bigger population and explanation of how strong causal connections are (*ibid.*). However, it calls for a fixed pre-specification regarding the research design (Robson, 2011). In this study, the phenomenon that has been investigated exists in an open, real world system. The possibility to pre-specifications of the study has been low, especially due to the fact that the empirical study has been carried out as a MFS in Chile, while the author lives in Sweden. The aim is characterized by explanation and deeper description. In order to reach the aim, there is a need of closeness, contextual understanding and holistic analysis. Therefore, qualitative method has been chosen for the study. Also, the working process was anticipated to be iterative. This has meant that what was planned in one stage of the process, often had to be re-planned in other stages. The choice of a flexible method meant that this anticipated iterative process could be used to strengthen the study, rather than weakening it.

2.2.2 Case study

A qualitative research design offers a range of different methods for data collection, such as case studies, multiple case studies, ethnographic studies and grounded theory studies (Robson, 2011). Case study method is according to Merriam (2006) and Yin (2009) preferred when addressing more explanatory questions, with “how” and “why” character. Also, when a study focuses on a contemporary event and the investigator has little control over behavioural events (*ibid.*). The method allows a holistic understanding of a real life event and can help to explain complex, social phenomena (Yin, 2009). A challenge is however to cope with the richness of the phenomenon, plenty of variables and a great amount of data (*ibid.*). As a tactic to meet this, multiple sources should be used to triangulate data. The case study and qualitative method, mean that the result can not be generalized to larger populations (Holme & Solvang, 1996; Yin, 2009). However, Yin (2009) argues that analytical generalization is possible, in the aspect that the result of the case study can be discussed in relation to previous theory. Out of the numerous methods that qualitative research offers, the choice in this study fell on a case study. There were several reasons to this. The chain was and is an actual and contemporary event. The level of control over the situation was low, with a very little degree of experimental influence. Two of the research questions ask “how” and “why” and the aim is explanatory. These characteristics comply to a high degree with typical characteristics and arguments for use of case study design. Given the background and the research problem of this study, it was also natural to have the case study approach. An alternative to a single case study and an initial idea of this study, was to carry out a multiple case study. However, the geographical distance to the other possible case

chain, the insight of that a deep contextual understanding was needed to reach the aim and logistical reasons, made that the choice fell on a single case study.

2.3 Literature review

When carrying out a study, there are several reasons to search and review previous literature (Robson, 2011). Carrying out a literature review, is also an important step in case studies (Yin, 2009). The literature review in this study has been carried out in several stages. Firstly, to orientate within the subject; to identify a research problem, gaps in existing research and the existing “frontier” of literature within the area. The following searches were carried out to present an adequate theoretical framework. Searches have mainly been carried out in databases Primo, Web of Knowledge and Google Scholar. The key search terms were developed from the research questions and aim. Examples of search terms are *value chain*, *supply chain*, *forestry*, *sawn wood*, *small-scale*, *value based*, *FSC* and *Fairtrade*. The terms have been used in combination with each other and with synonyms. Source, timeliness and interpretations are some factors that have been considered (Holme & Solvang, 1996). In first hand, sources from peer-reviewed literature have been used. However, there is a lack of peer-reviewed literature in some areas, where there although existed not peer-reviewed literature. Therefore, a number of not peer-reviewed literature have been used, with awareness of this. The results of the initial searches were poor; very few studies target small-scale, sawn wood/forest products and value based value chains. By broadening the search terms, exploring references in previous studies and by adding search terms such as sustainable SCM and sustainable partnerships, the result was more fruitful.

2.4 Collection of data

This section presents choices regarding the unit of analysis, respondents and detailed descriptions of the data collecting method. In each section as well as in a last separate section, processes of quality assurance are described.

2.4.1 Choice of unit of analysis

Defining and choosing the unit of analysis, is a crucial step in designing a case study (Yin, 2009; Holme & Solvang, 1996). The unit of analysis in this study, is the sawn wood value chain which origins from the company SSC Americas/Fair Wood Connection in Chile and stretches to Sweden. When preparing this thesis the aim was to find a suitable subject for a MFS, regarding business development and SFM in South America, due to the author’s interest in these issues. In the search for a suitable research problem that addresses these issues, contact was established with the companies SSC Forestry Group and Sense Group, which suggested topics for research and offered the possibility for the author to carry out a study. Two stakeholders related to the Curacautín chain, emphasized the need for more research that explain how value based, small-scale sawn wood chains are structured, function and enabled. Not many chains of this specific type exists in South America and out of the existing pilot chains in the FSC- and Fairtrade dual labelling project, the Curacautín chain was the only chain which succeeded to put a product permanently on the market during the project time. Therefore, the Curacautín chain was chosen as the case study unit.

2.4.2 Choice of respondents

When choosing respondents in a qualitative study, the aim should be to increase the information value and create a ground for a deeper understanding of the unit of analysis (Holme & Solvang, 1996). Therefore, the choice of respondents should neither be random or temporarily.

Strategically, this can imply a selection to get as big variation width, as possible (*ibid.*). In **table 1** are all respondents presented, which have been interviewed in the case study. A majority of the interviews were carried out in Chile, during the fall 2014. Below, choices of respondents are explained.

Table 1 Respondents in the case study

Name, position, organization	Form of interview	Date for interview	Form of validation	Date for validation
Aaron Kaplan, CEO, Sense Group	In person, phone, e-mail	2014-09-12	Cited sentences	2015-05-21
Rose Dumas, Supply chain development manager, FSC Sweden	In person, phone, e-mail	2014-09-10	Cited sentences	2015-05-20
Maria Ines Miranda, Managing director, SSC Americas	In person	2014-10-21	Summary	2015-03-16
Isabel Dumas, Managing director, Fair Wood Connection	In person	2014-10-21	Summary	2015-03-16
Berty van Hensbergen, President, SSC Americas & SSC Forestry Group	Skype, e-mail	2015-04-02	Summary	2015-04-10
José Emilio Chahin Sarah, Former international trader of native forest	In person	2014-11-12	Summary	2015-03-15
Thomas Ruf, Owner, RF Lumber	In person	2014-11-14	Summary	2015-03-16
Inger Gustafsson, CEO, Bovalls dörrbyggeri	Skype, phone	2015-02-12	Summary	2015-03-15
Bruce Uhler, Environmental Ambassador & Sustainability Manager, Kährs	Phone, e-mail	2015-02-17	Summary	2015-02-27
Alex Jarpa, Wood procurement manager, SSC Wood Technologies	In person	2014-11-04	Direct oral validation*	2014-11-04
Nancy Hintz Inostroza, Administrative, SSC Wood Technologies	In person	2014-11-05	Direct oral validation*	2014-11-05
Ruben Cheuquepan Lanera, Forest owner, FSC Group Curacautín	In person	2014-11-07	Direct oral validation*	2014-11-07
Juan Huilcal Curinado, Forest owner, FSC Group Curacautín	In person	2014-11-18	Direct oral validation*	2014-11-18
Mireja Corrales Rodriguez, Forest owner & VC, FSC Group Curacautín	In person	2014-11-07	Direct oral validation*	2014-11-07
Felix & Flor Ramon Guiñes, Forest owners, FSC Group Curacautín	In person	2014-11-17	Direct oral validation*	2014-11-17
Juan Quidel Huilcal, Forest owner, FSC Group Curacautín	In person	2014-11-07	Direct oral validation*	2014-11-07
Leonardo Araya, Forest Engineer, CONAF	In person	2014-11-05	Direct oral validation*	2014-11-05

**Interview held in Spanish. The method of direct validation is explained under the section 2.4.3 Interviews.*

To get an initial understanding of the suggested research problem and the Curacautín chain, the study started with exploring interviews with Swedish stakeholders involved in the chain. In Chile, the first interviews were carried out with key stakeholders in the managing company. It turned out that few persons works at FWC, whereupon the choice was to interview the founder, the managing director, wood procurement manager and the administrative at the wood procurement company. Out of the six forest owners that supply the chain, five forest owners were interviewed. The sixth forest owner owns a very small area of forest and has not been very involved in the chain (pers. mes., Jarpa, 2014). Therefore, it was considered that an interview would not increase the information value and the already performed interviews were also considered as sufficient. Two persons with experience in global sawn wood trade and forest management of native forests were also interviewed, in order to reach a broader contextual understanding. An interview was also held with the owner of the sawmill, where the sawing of the Curacautín chain is outsourced. In Sweden, additional interviews were carried out with the two manufacturing customers in the chain as well as the third co-founder of SSC Americas.

2.4.3 Interviews – choices, method and quality assurance processes

This section presents the choices of interview types, the method while carrying out the interviews and also processes of quality assurance. Interviews can be conducted in different ways, such as direct respondent interviews and secondary interviews and by different forms; for example personal, by telephone or by e-mail (Holme & Solvang, 1996; Robson, 2011). The structure of the interview can be unstructured, completely structured and semi-structured (Holme & Solvang, 1996). To get first hand information and as rich information as possible, direct interviews are often particularly useful (Holme & Solvang, 1996; Jacobsen & Thorsvik, 2002). Furthermore, they allow a good contact between the respondent and the interviewer. Semi-structured interviews have the advantage of allowing the respondent *”much more flexibility of response”* (Robson, 2011, 279). Also, there is the possibility to pose follow up questions or change the questions during the interviews. Challenges related to interviews are however that they are time-consuming, create extensive material of empirical information and take a long time to process (Holme & Solvang, 1996).

In this study, all interviews have been conducted as direct interviews, to enable collection of as rich information as possible. The major part of the data collection was performed in Chile, during October and November 2014. Almost all, 15 out of 17 interviews, have been carried out with semi-structured interview guides. The reason to the semi-structure is to connect the data collection to the research questions and theoretical framework; to not get lost in the extensive material of empirical information. Also, the semi-structure was preferred because of the freedom it allows to pose follow up questions, as well as giving flexibility to the respondent’s answers. A majority of the questions were constructed to correspond to the theoretical framework. Two interviews were carried out as un-structured, orientating interviews in the beginning of the study. All respondents were contacted prior to the interview, to ensure participation and provide an explanation of the study. Notes have been taken during all interviews and all semi-structured interviews were recorded, after allowance from the respondent. All interviews that were held in English and Swedish have been transcribed. The transcriptions have been sent to the respondents, which have been given the chance to validate them. Seven out of the eight interviews that were held in Spanish, were carried out with a Spanish-English interpreter. Instead of transcript validation, these were direct validated. This means that notes were taken through the whole interview by the interviewer and the interpreter. In the end of the interview, the interviewer described the perceived main concept of the respondent’s answers, for the respondent. The respondent was then asked to comment if anything was perceived wrong. Eventual misperceptions was corrected and written down. Confirming questions, such as *“did I understand you right when you said..?”* and *“anything more?”* were used in all interviews as part of validation processes. Several interview guides were used; two of them are presented in Appendix 1.

Interviews with SSC Americas (SSC A) and SSC Wood Technologies (SSC WT)

The interviews with the respondents from SSC A and SSC WT, were carried out at the offices of each organization. The atmosphere was in most cases relaxed and familiar, because of the existing “host”-relation between the interviewer and a number of the respondents². During these interviews there were quite many disturbances such as interruptions by other staff and telephones ringing. During four of these interviews, two “exercises” were conducted within the interviews. The reason to this was both to use it as a mean to triangulate information, as well as a way to stimulate and take part of the respondent’s own analysis of the situation. The first

² This is positive in the sense that this hopefully enables access to more information. However, it is also a challenge due to how the relation might affect both the respondent and the interviewer.

exercise was a fast **SWOT³-exercise**, where the respondents were asked to spontaneously mention what they thought about under each SWOT-heading. The second was a **word-game**, where critical factors identified in the literature review had been written on paper pieces. Some pieces of papers were blank and the respondents were asked to add factors on them, if they missed any. The respondents were then asked to take the factors they felt some relation to and explain why they had chosen the factors. This could be both positive and negative.

Interviews with forest owners

All forest owners were contacted in beforehand of the interview, to ensure participation and provide an explanation of the study. A person in the affiliated company to the author's host organization in Chile contacted the forest owners, due to language barriers. This was not ideal, due to the influence the relation might have on the respondent's willingness to participate. Also, it was not possible to give a personal presentation. To ease these disadvantages, a written presentation was given as a manual to the person who contacted the owners. All contacted farmers agreed to participate. One was met personally to be given further explanations of the aim, before the respondent agreed to participate. All interviews were held in the forest owners' homes. Participants were the interviewer, the Spanish-English interpreter and the respondent. Sometimes family members were also present. Before the interview started, a presentation was given of study and the interviewer. Amongst other things, the presentation concerned the interviewer's roots from a small forest farm in a rural area, with the purpose to try to establish a common connection. Cookies were brought as snacks to the interviews, to try to create an informal and relaxed environment. Most of the time, the interview environments were calm, but some interference existed; as a television in the background, comments from family members and interruptions when the respondents offered tea. Each interview lasted about one hour to one and a half hour. Four of the five interviewed farmers also showed some of their forest stands and about half an hour to an hour was spent on this. The interviews were validated by direct validation, see paragraph two under "Interviews" for explanation.

2.4.4 Documents, archival records and observations

An important part of case studies is the use of multiple sources (Yin, 2009). When using documents and archival records, it is however important to consider the accuracy as well as under which conditions it was produced. Access has been given to a number of documents regarding SSC A and SSC WT, in form of for example business contracts, budgets and evaluations. Archival records were forest management plans and a membership list. One open observation of a harvest with one of the forest owners was carried out. Only a few of the sources are explicitly used in the result. However, the access to them has contributed to an increased understanding of the chain and has also reinforced personal messages.

2.4.5 Data analysis

Several different approaches can be used when analysing empirical data, for example thematic coding, discourse analysis and grounded theory approach (Robson, 2011). Yin (2009), Robson (2011) and Holme & Solvang (1996) propose an analysis where the data is categorised after themes. These themes can preferably be predetermined and relate back to the research questions (Robson, 2011; Yin, 2009). By this, the theoretical framework can be confirmed – or contradicted. Thematic coding analysis has been used as data analysis in this study. This was due to the arguments of the benefits of the analysis presented by the method literature and also that quite detailed descriptions of the analysis were available. Also, the use of the analysis enabled a strong connection back to the research questions, which was preferred due to the rich amount of collected data. The data was grouped after the themes in the theoretical framework.

³ SWOT- an analysis of strengths, weaknesses (internal factors), opportunities and threats (external factors).

This framework also constituted the base for the interview guides. By this way, data was already a bit structured by the themes. The theoretical framework does in turn relate back to the research questions. For each theme in the analysis, information related to the theme was identified in the data. This was done by reviewing notes, transcripts and records. The conceptual framework was then used to analyse the selected data.

In the beginning of the study an initial plan was also to carry out an analysis of the value chain distribution, for example by decomposition of the consumer price. However, it was realised that in order to carry out such analysis, a number of other factors first needed to be explained regarding the chain, such as the structure and collaborations, which are presented in this thesis. Also, questions were posed regarding financial figures such as profit margin, but not all respondents in the chain could or wanted to answer the questions.

2.4.6 Ethical considerations

With respect to that different individuals and representatives for companies have been interviewed in this study, certain steps (Robson, 2011) have been followed to try to ensure as good ethics towards them as possible. All respondents have been contacted in beforehand, to ensure participation and provide an explanation of the study. The study's aim, background and a presentation of the interviewer, has been given. It was clearly stated, that the thesis is an open document, available for the public. All respondents have been given the chance to validate the interview, either by a written summary or by direct validation. The interviews with the forest owners were carried out without presence of any representative from the procuring company.

2.5 Method discussion

To achieve credibility and trustworthiness in a quantitative study, several tactics can be used (Yin, 2009; Robson, 2011). Yin (2009) suggests the use of multiple sources, writing protocols and to do pattern matching. Holme & Solvang (1996) mean that challenges regarding the quality of data in a qualitative study, concern the researcher's perception of the situation and the researcher's impact on the respondent. Although that quality assurance processes have been described above, some additional words are said here regarding the study's trustworthiness and transferability. A number of steps have been followed, to establish trustworthiness. A majority of the interviews have been recorded and respondents have validated the interviews. Questions have been constructed in different ways and posed to more than one respondent but "aiming" at the same spot, as a mean of triangulation. Data gathering steps are described and notes and audiotapes are saved. The progressive nature of the study has been recognized and the process has been iterative. The study has been adapted and developed, due to changes in perceptions and findings along the process. However, there is a risk that the author perceives and interprets answers or the result in a certain way, due to personal pre-understandings. Respondents might answer what they think sounds good, due to dependences in the chain and concern of own reputation. The constructed research questions and in the prolonging the data gathering, might omit empirical fields where enabling factors can be found. The theoretical framework is a summary of several theories, which might make the study loose depth, but it hopefully reduces the risk to miss crucial factors that enable the chain⁴. A possible deficit is also that information might have been lost due to language deficiencies. Long summaries, might have decreased the respondents' tendency to examine them. The transferability of the result is limited by a deep understanding of contextual factors for other value chain conditions, for the reader.

⁴ Pullman & Dillard (2010, 745): "In the past, we could meaningfully focus on one supply chain function or activity.. ... "Such is no longer the case, especially with products differentiating themselves on credence attributes".

3 Theoretical perspectives and previous research

This chapter starts with a definition of key terms, followed by a presentation of development of value chain theory and key models for value chain structures. Further, value based supply chain theory, a summary of critical factors regarding the functioning of value based chains and theory regarding sustainable partnerships, are presented. The chapter ends with a synthesis of the theoretical perspectives and a conceptual framework, which binds together chosen aspects of the presented theories.

3.1 Definition of key terms

This section presents the selected theoretical definition of a chain and why this definition is chosen. Also, terms of SFM, SMFEs, small-scale and stakeholders are defined.

3.1.1 Theoretical definition of the chain

Production chains can be defined and analysed by a number of different theoretical frameworks, such as perspectives connected to *supply chains*, *value chains* and *value networks*. Chopra & Meindl (2013, 3) define a supply chain as all parties that are directly and indirectly involved to fulfil a customer's request. Kaplinsky & Morris (2003, 4) define a value chain as all activities that are required to bring a product or service from conception to final consumers and final disposal. These definitions are quite similar and the perspectives are sometimes interchangeably used (Hughes *et al.*, 2014). Nevertheless, value chain analysis is often described as more focused towards processes in the chain, which brings value to the product or service (*ibid.*). In this thesis, the value chain perspective is used as a main definition and perspective, since it is considered as particularly useful when investigating new producers that are trying to enter global markets (Kaplinsky & Morris, 2003, 2). Also, it has a stronger focus on interlinkages between different stakeholders.

3.1.2 Sustainable forest management

The concept of *SFM* started to emerge in the forest sector in the mid 1980's (Arts *et al.*, 2010), simultaneously with the emergence of the notion of SD. In the beginning, the emphasis of SFM was on the management of timber production. With the time, the concept has changed and it now includes a broader understanding of which role forests have in the society (*ibid.*), based on the three pillars in SD (Davenport *et al.*, 2010). Still, the meaning of SFM differs among different actors, contexts and regions (van Dijk & Savenije, 2009).

A definition that Davenport *et al.* (2010) mean might be one of the most commonly cited definitions of SFM is "*The stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems (MCPFE 1993)*" (Davenport *et al.*, 2010, 77). This was formulated at the Ministerial Conference for the Protection of Forests in Europe in 1993 and was later adopted by the Food and Agricultural Organization of the United Nations (**FAO**) (*ibid.*). A critique against this definition is that it does not really answer how SFM should be achieved. Also, many operations claim to practise SFM but do not achieve sustainable timber yields or sustainability regarding for example biodiversity (*ibid.*). Further information regarding problems and challenges with SFM is shortly presented in Appendix 2.

3.1.3 Small and medium sized forest enterprises and small-scale

SMFEs and *small-scale* are further definitions that are used with different meanings and sometimes interchangeably. The meaning of them and the threshold value of what is considered as small, vary depending on the context (Harrisson *et al.*, 2002). The term small-scale forestry does often refer to the size of the farm, compared to the context (*ibid.*). SMFEs usually refers to “*small-scale forest-based businesses that operate primarily in rural areas*” (Tomaselli, 2013, 334). When SMFEs is used in this thesis, it refers to all sorts of SMFEs, not necessarily only forest owners and not necessarily only stakeholders in rural areas, but also for example small-scale sawmills or traders.

3.1.4 Stakeholders

Stakeholders is often used when addressing issues related to sustainable business development and corporate social responsibility (CSR). Roberts (2003) emphasises the connection between the value of a company’s brand, the company’s reputation and that the reputation reflects the company’s relative success in fulfilling the stakeholder’s expectations. The stakeholder concept which Roberts (2003) presents, includes not only external influences such as communities, NGO’s, customers and governments, but also business partners; suppliers, employees, distributors and more. This is slightly different from Rainey’s (2010) definition, which excludes for example customers and suppliers. When *stakeholder* is used in this thesis, it refers to the definition by Roberts (2003), following the idea that the value of the brand is connected to reputation and that stakeholder’s views; which includes customers, business partners and suppliers, affect this.

3.2 Value chain theory

The value chain concept was first introduced by Porter (1985), which describes it as the key activities within an organisation that generate value to a product or service. The use of the value chain concept serves to create an understanding of value-adding processes along the chain (Hughes *et al.*, 2014). While the supply chain can be derived to three or more entities that are directly involved up- and down streams in a chain, the value chain concept is wider and is often described as an activity/process chain. The value chain concept includes the supply chain, but also issues such as governance and an enterprise’s collaborations with other stakeholders (Hughes *et al.*, 2014; Wahl & Bull, 2013). Through this, the value chain perspective is wider and enables explanation of producers’ access to global markets (Kaplinsky & Morris, 2003).

During the 1990’s, both the concepts of value chain theory and supply chain theory developed. From Porter’s (1985) value chain concept with focus on competitive advantages, the global commodity chain framework elaborated, which ties together the idea of a value chain within a company with the global organization of industries (Gereffi *et al.*, 2006). This framework was further developed by Kaplinsky & Morris (2003) and Gereffi *et al.* (2006) among others, into inter alia the global value chain concept (Wahl & Bull, 2013). The importance of coordination across company boundaries is highlighted, but also how global buyers influence the formation of production networks. Based on these perspectives, value chain theory is by Kaplinsky & Morris (2003) presented as a framework to analyse not only the activities along a chain, but also vertical and horizontal interlinkages between stakeholders in the chain. After the introduction of certifications in for instance the forest sector during the 1990’s, some academical literature evolved regarding private regulation in global value chains (Wahl & Bull, 2013). However, up to this date, few peer-reviewed published studies exist regarding *value based* value chains, or *small-scale sawn wood* value chains originating in developing countries

(Aoudji *et al.* 2014; Purnomo *et al.* 2014). Adding sustainability values and a focus on structure and management to such small-scale value chains; there is a gap in literature.

The traditional supply chain theory has its origin in strategic management, focusing on efficiency (Roberts, 2003). Parallel to this development, with more ethical standpoints, was the development of sustainable supply chain theories. Supply chain management as a key factor for SD projects in developing countries is addressed by Diniz & Fabbes-Costes (2007), Seuring & Muller (2008) as well as Pullman & Dillard (2010), which focus on management of value based supply chains, including Fairtrade chains.

Perhaps, value chain and supply chain theory should not be described as separate schools of thoughts at all in some cases; several previous studies on forest products chains use supply chain and value chain terms interchangeably (Hughes *et al.*, 2014, 2). Overall, there is some ambiguity regarding the concepts of supply chain theory versus value chain theory and what they include (*ibid.*). In this thesis, value chain theory is presented as a framework for the structure of the value chain, with the addition of sustainable supply chain theory to include value based aspects related to chain management. Below, value chain theory regarding structures of value chains is presented and in section 3.3, value based supply chain management.

3.2.1 Structure of global value chains

The value chain concept serves to create an understanding for where and how much value, that is created through each stage of a supply chain (Hughes *et al.*, 2014). Value chains are usually described by four core elements; 1) in- and output structure/the stages of activities 2) the geographical dispersion of activities 3) governance structure and 4) an institutional environment which describe how the international context influence activities in the chain (Aoudji *et al.*, 2012). In- and output structure in a simple value chain are activities such as product development, production, marketing, consumption and recycling and the inputs needed for this, as well as produced outputs (Kaplinsky & Morris, 2003). Primary activities are “*processes of supply*” (Kaplinsky & Morris, 2003, 6) as well as the transformation of inputs to outputs. Support activities are processes, which support stakeholders in the chain, to carry out the primary activities. **Figure 2** presents examples of value chain activities and the division of primary and support activities (Goes & van Dijk, 2013, 166).

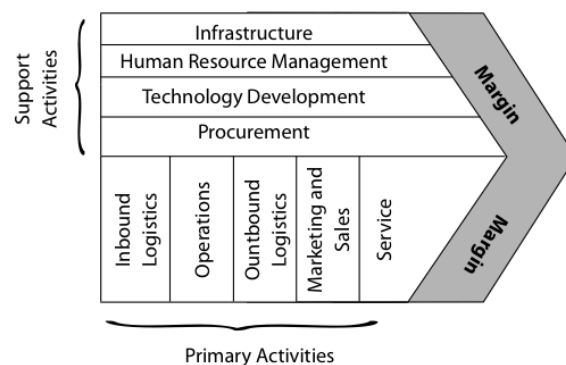


Figure 2. Primary and support value chain activities (Goes & van Dijk, 2013, 166).

Geographical dispersion refers to mapping processes and where they take place. The governance structure describes how the chain is governed. Finally, the institutional environment concerns for instance factors that are external to a chain; such as regulations, trade-agreements and or other factors, which affect inter alia the business environment.

The competitiveness of a chain is a necessary condition to penetrate global markets (Kaplinsky & Morris, 2003). Therefore, value chain optimization and supply chain optimization are of importance to obtain a competitive advantage (Porter, 1985). To obtain efficiency, companies should concentrate on resources that they possess, that are relatively unique and outsource remaining competences to other stakeholders in the value chain (Kaplinsky & Morris, 2003). However, competitiveness does not alone explain the ability to connect to global markets (*ibid.*). The governance structure is also of high importance. “*This is because each of these producers needs a point of entry into global markets, that is they need to be connected*” (Kaplinsky & Morris, 2003, 60). Different form of intermediaries will effect entry possibilities to global markets and also affect the possibility for individual producers to upgrade. The form of governance structure, affects the kind of intermediaries that exists within a chain and does therefore also affect the possibilities to market connection. **Figure 3** illustrates the two conditions to explain the ability to connect to global markets.

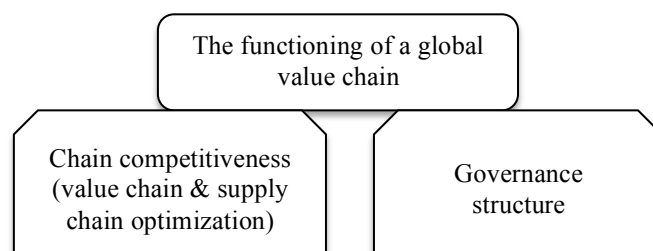


Figure 3. Building-blocks for the functioning of a global value chain.

Regarding governance structure, Gereffi *et al.* (2006, 98) states “*We argue that the structure of global value chains depends critically upon three variables: the complexity of transactions, the ability to codify transactions, and the capabilities in the supply-base*”. **Figure 4** shows these three variables. The factor of complexity refers to the complexity of information and knowledge, which is required to sustain a transaction. This especially concerns products and processes. Ability to codify transactions refers to how information and knowledge can be transmitted efficient in the chain, *the degree to which this complexity can be mitigated through codification* (Gereffi *et al.*, 2006, 87). Capabilities in the supply base refers to the capabilities of suppliers in relation to posed requirements. Gereffi *et al.* (2006, 98) mean that these three variables affect the governance structure. In turn, the variables often depend of the effectiveness of the industry stakeholders, the surrounding social processes, dispersion and the adoption of standards or other codifying schemes. Also, the variables are sometimes determined by the technological characteristics of the products or the processes within a chain.

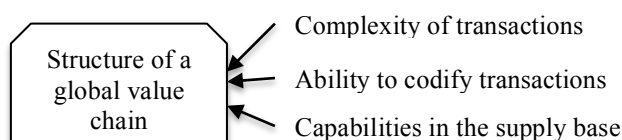


Figure 4. Variables affecting the structure of a global value chain.

As mentioned, the three variables in figure 4 vary inter alia on the adoption of standards (*ibid.*). In order to adhere to clear product specifications and deliveries on time, the chain has to be coherent (Morris & Dunne, 2004). This requires governance, which in turn require specific lead firms along the chain, to take on specific chain management roles regarding organisation, power exercise and decision making (*ibid.*). This is important, for upgrading the chain. Lead firms can be defined as companies that set “*overall parameters under which the value chain operates*” (Morris & Dunne, 2004, 35).

Gereffi *et al.* (2006, 83) present five conceptual models regarding governance types of value chains. Relational value chains have complex interactions between buyers and sellers, which often creates mutual dependence, high levels of asset specificity and might be managed by reputation or family ties. In captive value chains are small suppliers dependent on much larger buyers and the chains are often signified by a high degree of lead firm control. The three other governance types are market governance, modular value chain governance or hierarchical governance. In Appendix 2 a figure is presented which illustrates key determinants for the governance types (Gereffi *et al.*, 2006, 83). These key determinants, which are the level of the three variables that affect the governance structure, decide which type of analytical governance the global value chain has (*ibid.*).

Value creation in this project refers to structure and functions of a value chain, that depends on a complex fabric of factors, ranging from more traditional competitive advantage factors to systemic network abilities and governance. All these factors, affect the building of the chain and the ability to penetrate global markets.

3.2.2 Sawn wood value chains

In narrowing the value chain perspective from a general level to specifically sawn wood value chains, Nord (2005) and Kaplinsky & Morris (2003) offer an overview of two different sawn wood value chains. None of these papers address small-scale sawn wood value chains in developing countries, but they illustrate a general value chain structure. Kaplinsky & Morris (2003, 5) describe an extended wood value chain, by presenting production stages and resources inputs. A generic forest value chain starts with inputs to forest management and forestry. From the forest stands, logs are harvested and processed in sawmills. Further value adding processes take place at the secondary manufacturing stage, such as for instance furniture manufacturing. Depending on which market, the products pass through various stages of intermediaries and/or retailers, out to the consumers. After the consumer's use, the value chain perspective can also include the recycling stage.

Figure 5 shows an example of a sawn wood value chain, in this case the Swedish sawn wood value chain (Nord, 2005, 3). The figure exhibits the flow of physical products and stakeholders involved in the value transformation from forest to sawn wood products, for instance solid wood products.

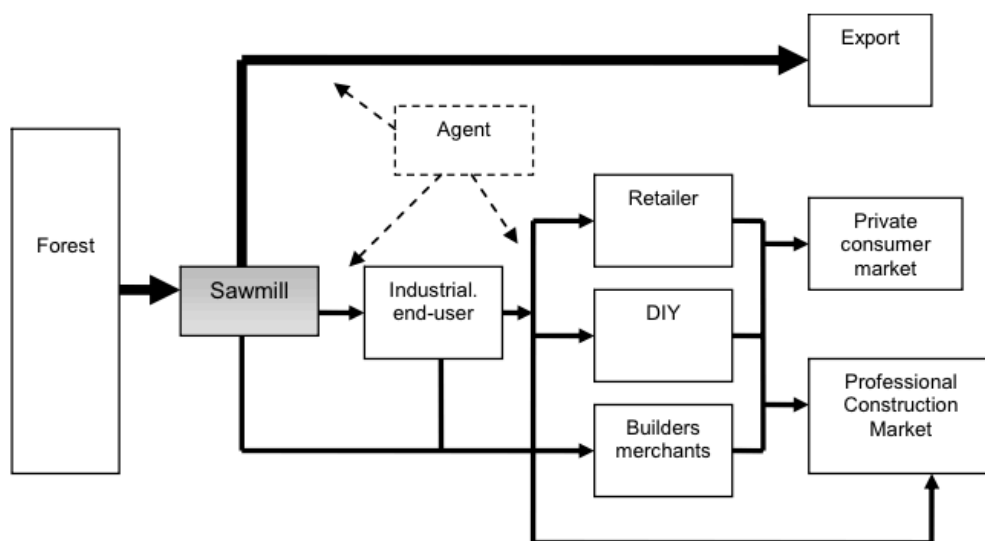


Figure 5. Example of a sawn wood value chain (Nord, 2005, 3).

A number of uncertainties affect the structure of sawmill value chains (Nord, 2005, 2-4). Wood properties, availability of raw material, forest ownerships and logistics are uncertainties connected to processes at the forest stage. At the sawmill stage, there are several issues to manage the raw material input to meet demand from customers. One is the “*difficulty to link customer demands in terms of wood properties with actual wood properties of the incoming raw material*” (Nord, 2005, 3). Both the Swedish sawmill sector as well as the international forest industry have traditionally been production orientated (Hansen *et al.*, 2014; Nord, 2005). These types of chains are signified by an efficiency focus and a belief that low costs are a key factor to market success. However, this focus has restrained the development of new or value added products in the forest industry, according to Hansen *et al.* (2014). There is a call for chains with a more market-oriented approach; a stronger focus on meeting the wants and needs of the customers by for example differentiation strategies and value adding processes (*ibid.*). Additional information regarding forest products chains can be found in Appendix 2.

3.2.3 Small-scale sawn wood value chains

Only a few numbers of recent studies have a focus towards explanation of value chain structures of specifically small-scale sawn wood value chains. Taylor (2005, 434) means that forest products chains, which origin in the global South, in general can be characterized by decentralized production and trading networks, that are largely controlled by large retailers and international trading companies. Van Dijk & Savenije (2009, 28) mean that costs and benefits are not equally distributed along such chains, in Latin America. Intermediaries and transporters normally receive the greatest share of the product value. This is supported by findings in two more recent studies by Purnomo *et al.* (2014) and Aoudji *et al.* (2014); which found value chain structures based on market governance. Global buyers were often subsidies to international retailers and had a controlling role in the value chains. Also, information exchange between suppliers and the global traders were low. One of two stages of local intermediaries traded material between raw material suppliers and global buyers (Aoudji *et al.*, 2014).

3.2.4 Summary - value chain theory and value chain structures

This section presents value chain theory, related to the structure and function of global value chains. Access to global markets and the structure of global value chains depend on value chain competitiveness, based on Porters (1985) ideas regarding competitive advantages. Furthermore, the governance structure of a chain is an important factor to explain the structure and ability for a global value chain to connect to global markets (Kaplinsky & Morris, 2003). The governance structure does in turn depend on three variables; “*the complexity of transactions, the ability to codify transactions and the capabilities in the supply-base*” (Gereffi *et al.*, 2006, 98). Adding industry specific uncertainties of sawn wood chains; the difficulty to link customers’ demands with actual wood properties, availability to raw material and logistics, also affect the structure and function of the value chain (Nord, 2005, 2-4). In order to govern adherence to required standards, Morris & Dunne (2004) mean that lead firms are required, which can manage and upgrade the chain. Gereffi *et al.* (2006) suggest five types of governance which can explain the governance structure in value chains and therefore also abilities of the chain. The governance and structures of small-scale sawn wood chains are often of market-based types and controlled by international traders (Aoudji *et al.* 2014; Purnomo *et al.*, 2014). Next section presents sustainable supply chain theory; to form a conceptual framework which includes value based attributes of social- and environmental certified value chains.

3.3 Value based supply chains

With the prevalence of certifications and companies where sustainability is a crucial part of the business idea and core values, there is a need to understand how value based chains actually function (Karjalainen & Moxham, 2013). However, few studies exist regarding value based chains in business management literature.

Pullman & Dillard (2010) define a value based organization, as a chain or a company, which offers a product or service where sustainability values constitute a crucial part of the product or the service. A conclusion reached by Pullman & Dillard (2010) in their case study, is that the supply chain design and management enabled the keys to the success for the organization. To obtain a price premium, it is necessary that the unique attributes of the product which are acquired in the production process, are sustained along the chain. Apart from traditional supply chain attributes, the unique attributes can be of qualitative and value-based types, such as trust or care for animal health. The bullet list presents a summary of *key features and attributes* for the value based supply chain in Pullman & Dillard's (2010) study:

- Credence attributes; trust, egalitarianism, individualism, family and community, health.
- Assurance of proper input values: suppliers possess required sustainability values.
- Product processes that support sustainability values throughout the chain.
- Transmit sustainability values to customer.
- Reward system that links raw material ownership directly to desired product characteristics throughout the chain.

The specific credence values, addressing shared social and environmental values, are crucial (*ibid.*). *"The values must provide the context, and through acting consistently with these values, they are reinforced along with the organizational and resource distribution systems that support these values"* (Pullman & Dillard, 2010, 764). To build a successful value based chain, the values must provide the ground for the chain and the chain must reinforce these values, all the way to the consumer.

Karjalainen & Moxham (2013) also emphasize integration and mean that it is a key feature in SCM in the context of FT chains. *"Linking suppliers into a firm's supply chains is critical if the firm is to deliver superior value to consumers"* (Karjalainen & Moxham, 2013, 276). All stakeholders in the chain need to be linked to the end consumers (Cousins & Menguc, 2006). Examples of elements of integration are buyer-supplier relationships, information systems and inventory management to manage product and material flows (Power, 2005). Karjalainen & Moxham (2013) argue for a need to improve the efficiency in FT chains, to overcome challenges with the extra price premium and problems with quality and yield. Inbuilt conditions in the chain, due to FT conditions or other value based conditions, can make that the chain is unable to compete with traditional chains on certain cost/efficiency issues. To still improve efficiency, other solutions are needed. Effective sustainable SCM require long-term relationships between stakeholders, creating win-win situations for all stakeholders (*ibid.*). Procuring stakeholders in FT chains need to *"look beyond traditional purchasing portfolio models to find the most efficient approaches"*, to *"leverage costs others than reducing purchase prices"* (Karjalainen & Moxham, 2013, 276). How to achieve this, is however not directly proposed by Karjalainen & Moxham (2013), which leaves propositions for future research rather than answers. Although, they suggest other ideas; such as that the traditional producer focus needs to be combined with a customer focus and a greater emphasis for quality management through the whole chain.

3.4 Enabling and constraining factors

Factors that enable and constrain the development of value based value chains can derive from several different areas. The success to connect to global markets is determined by efficiency and competitiveness, but also on governance and interlinkages (Gereffi *et al.*, 2006; Kaplinsky & Morris, 2003). External environment, uncertainties related to wood characteristics, supply and demand, are further factors that affect wood value chains (Nord, 2005). The SCM of a chain decides if sustainability values are successfully engendered, managed and transmitted through the value chain (Pullman & Dillard, 2010). Barriers for global value chains might be a weak business model in itself or enterprise development constraints such as lack of organizational, technical and financial capabilities (Aoudji *et al.*, 2012; Donovan *et al.*, 2006; Tomaselli *et al.*, 2013). External conditions such as forest legislation and the competition from illegal logging constitutes other factors that affect the enterprise environment (Arts *et al.*, 2010; van Dijk & Savenije, 2009).

Trienekens (2012) argues that all these factors, critical for the ability to connect to global markets, in fact can be related to three core areas; market access and market orientation, available resources and physical infrastructure, and institutions. These factors can be internal to the value chain, as well as external to the chain. **Figure 6** presents these three core areas and critical factors related to them (Trienekens, 2012, 57).

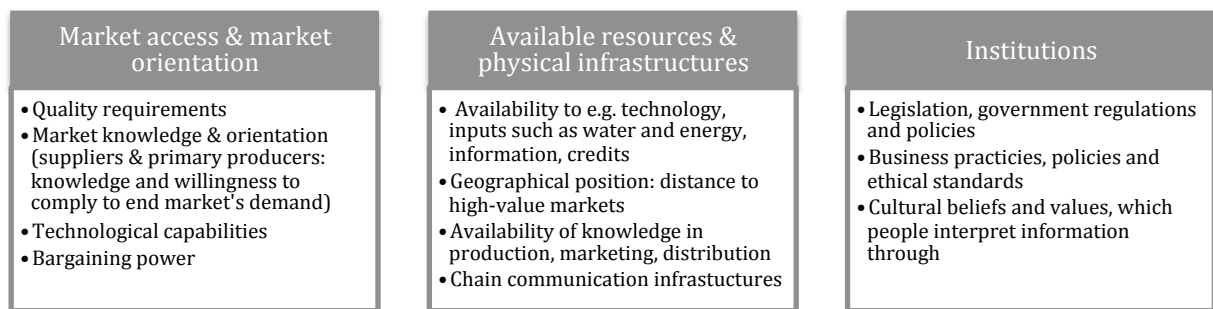


Figure 6. Three core areas of critical factors for global value chains (Trienekens, 2012, 57).

The reasoning by Trienekens (2012) can help arrange critical factors and relate them to strategies for upgrading a chain. Few previous papers offer a comprehensive but yet simple framework, which includes several theoretical fields, for doing this. However, the factors within the core areas appear very interrelated or almost the same, despite Trienekens (2012) division of them. Derived from the core areas of critical factors, Trienekens & van Dijk (2012) suggest four strategies for value chain upgrading: through increased value added, improved market access, improved value chain governance structure and through partnerships. Ultimately, improvement of market access might actually be reached by upgrading the chain via partnerships (*ibid.*) Governance has already been addressed in this thesis' theoretical framework and a framework for partnerships, is presented in the section 3.5.

Table 2 offers an overview of a literature review that identifies reported constraints and/or enabling factors for a successful value chain. The literature included in the review, belongs to value chain literature and sustainable supply chain literature. It is not specific for any industrial sector and is therefore called “general literature”.

Table 2 Enabling and constraining factors for the functioning of value based value chains, according to general literature

Theme, Authors	Enabling or supportive factors	Constraining or challenging factors
Value chains & bottom of the pyramid (BOP) (de Boer <i>et al.</i> , 2012)	-	Lack of adjusted banking products Non-existent sound industrial policies. Absence of organized farmers. High trade tariffs. Lack of knowledge of consumer requirements. Lack of knowledge of market demand.
Supply chain management & SD projects (Diniz & Fabbe-Costes, 2007)	Market differentiation by certification integrated in SCM context. Network vision that promotes co-operation among actors. Market approach and focus a necessity; consider market opportunities and requirements.	Insufficient system vision among stakeholders in the chain, about the chain/project. Lack of common goals. Lack of communication. Lack of management know-how.
Value chain analysis (Kaplinsky & Morris, 2003, 98-99)	Joint action; quality auditing, branding, lobbying. Intermediaries that enable SME's capacity to upgrade. Chain competitiveness (competitive advantage).	Quality, environmental and labour standards that require documentation in great detail. Global governance that require global conformance requirements, e.g. specific material grades or information systems.
Value based supply chains (Pullman & Dillard, 2010, 744)	Unique product attributes sustained along the entire supply chain. Unique attributes communicated to end customer. Traceability and transparency throughout the chain.	-
Sustainable supply chain management (Seuring & Müller, 2008, 1704)	<i>"Company-overlapping communication".</i> <i>"Management systems".</i> <i>"Monitoring, evaluation, reporting, sanctions".</i> <i>"Education for purchasing employees and suppliers".</i> <i>"Integration into the corporate policy".</i>	<i>"Higher costs for sustainable SCM".</i> <i>"Coordination complexity".</i> <i>"Insufficient or missing communication".</i>
Value chains in developing countries (Trienekens, 2012, 53, 59)	Certification according to retail markets' standards. Seamless product flows. Seamless information flows. Market orientation for all stakeholders in the chain.	Quality standards at customer's markets.
Global value chains (van Dijk & Trienekens, 2012, 16, 20, 21)	A business model that link small producers to global value chains (large effect on the competitiveness). Unconventional partnering. Focus on innovation, combined with sustainability.	Quality standards at customer's markets (higher threshold access to the market). Lack of skilled, local workforce. No access to credit and other resources. Local regulations. Poor governance structure. Lack of infrastructure.

The overview reveals that management systems, quality auditing and certification systems integrated in the chain are mentioned by four out of seven studies, both as an enabling factor but also as a constraining factor (Diniz & Fabbe-Costes, 2007; Kaplinsky & Morris, 2003; Seuring & Müller, 2008). Compliance to international standards is important, but quality- and other requirements can also constitute a constraint to access global markets, because of difficulty for SMEs to fulfil them. "Seamless" communication through the whole chain, the

consumer included, as well as cooperation along the chain, appear to be key elements for successful value chains (Diniz & Fabbe-Costes, 2007; Pullman & Dillard, 2010; Seuring & Müller, 2008). A network vision, unconventional partnering and a management and value chain design that sustain unique value attributes along the chain, are further critical factors for the functioning of value based value chains. To summarize; information flows and management systems that promote a network vision and sustain value attributes, are important to create successful sustainable value chains.

Table 3 offers an overview from a literature review, that identifies reported constraints and/or enabling factors for a successful value chain, specifically for forest products value chains. Most literature in the overview has a value chain framework.

Table 3 Enabling and constraining factors for the functioning of value based value chains, according to forest specific literature

Theme, Authors	Enabling or supportive factors	Constraining or challenging factors
Timber value chains (Auodij <i>et al.</i> , 2012)	Efficient markets. Efficiency in marketing.	Lack of market information. High transaction costs. Difficult for traders to get timber supplies. Low return to smallholder farmers.
Certifications and small-scale forest management (Karmann <i>et al.</i> , 2009)	More of retail value to producers through Fairtrade premium.	Not sufficient amounts of timber available to be accepted as market partner. Lack of business know-how. Limited capital investment.
Forest enterprises and markets (Macqueen <i>et al.</i> , 2008, 6-14)	Smoothly working relationships within the chain. Offer products after resource base and with market orientation. Stakeholder capacity to fulfil customer request. Two ways communication. Competitive pricing. Compliance to grading, agreement schedules.	Forest ownership and tenure. Forest types and sustainability. Forest species, grading and pricing. Consumers; often far away, lack of information, lack of motivation.
Furniture value chains (Purnomo <i>et al.</i> , 2014)	Establishment of SMFEs associations. Improved access to financial institutions.	-
Certifications and forest management (Taylor, 2005)	Certification enables consumer identification of forest management minimum standards.	Difficulty satisfying international buyers' demands: species, volumes, and specifications. Costly certifications.
SFM (van Dijk & Savenije, 2009)	Financial incentives to SFM.	Unequal distributed costs and benefits along the chain, constrain SFM, which constrains SMFEs value chains.
Cross-cultural sales and marketing in the global forest industry (Wagner, 2014)	In person contact to build trust, between stakeholders in a global chain. Diligence to articulate & negotiate product quality and pricing. Cultural intelligence. Two or more languages. Knowledge in wood science. Awareness logistics, market intelligence, cash-flow. Multi-cultural teams.	-

The enabling and supportive factors differ among the literature, but market orientation (Macqueen *et al.*, 2008, 6-14), market intelligence (Wagner, 2014) and efficiency in marketing (Auodij *et al.*, 2012) are mentioned in three different studies. Factors such as financial incentives to SFM and greater share of the retailer value to promote SFM, are also mentioned as enabling and supportive factors by two studies (Karmann *et al.*, 2009; Van Dijk & Savenije, 2009). Macqueen *et al.* (2008, 6-14) and Wagner (2014) appear to take a broader, forest industry perspective as well as market perspective. Both of them mention the importance of both taking the market and supply base into consideration; the ability to negotiate and articulate what can be offered in relation to what the customers want. Two-ways communication, in-personal contact and relationships are also mentioned by both of them. Wagner (2014), which addresses marketing at a global level in the forest sector, stresses cultural intelligence and knowledge in global sales of forest products. More than two languages is a must for sales managers. Cross-cultural teams increase cultural intelligence.

3.5 Sustainable partnerships

Previous sections in this chapter have focused on value chain structures, sustainable supply chains and factors that enable or constrain the functioning of a chain. A number of factors in the last section relates to integration, collaboration, use of certification systems, trust building between stakeholders in the chain and smoothly working relationships (Diniz & Fabbe-Costes, 2007; Macqueen *et al.*, 2008, 6-14; Seuring & Müller, 2008, 1704; Wagner, 2014). Overcoming challenges related to more value based chains, imply a need for “new” solutions, not always built on “traditional” solutions such as cost reduction. FT chains are for example not able to compete with traditional chains regarding cost reduction in the same way, due to FT principles (Karjalainen & Moxham, 2013). To develop chains with credence attributes (Karjalainen & Moxham, 2013) or chains that address triple bottom line challenges (Nidumolu *et al.*, 2014), there is a need for new forms of collaborations.

Glasbergen (2011) defines partnerships for SD as “*collaborative arrangements in which actors from two or more spheres of society (state, market and/or civil) are in a non-hierarchical process, and through which these actors strive for a sustainability goal*” (Glasbergen, 2011, 2). Certification regarding SFM is one example of this (Glasbergen, 2011). The nature of intersectoral partnerships are different from business to business collaborations (**B2B**) for SD. Glasbergen (2011, 4) means that stakeholders in B2B share the same core logic, because they are operating in a competitive system with the primary goal to create profit. Intersectoral partnerships are however more problematic, as stakeholders might start from fundamentally different values. However, also many B2B collaborations for SD fail because of collaborative issues (Nidumolu *et al.*, 2014). Van Dijk & Trienekens (2012, 22) mean that the challenge for partnerships in value chains is to find out which factors that explain why the partnerships succeed. These factors can be internal or external, process- and context related.

Development of partnerships is described as “*the ladder of partnership activity*” by Glasbergen (2011, 4). Building the partnership, imply a number of steps. Firstly, to build mutual trust. Secondly, the partners need to explore the collaborative advantage they can create by the partnership and what value it brings for their own interest. To sustain the partnership, there need to be a collaborative advantage and also fairness in the distribution it, according to Glasbergen (2011). Thirdly, a rule system is needed, in form of for example a standard, code of conduct or certification scheme. The fourth level is about implementing partnerships agreements externally, on a broader scale, such as incorporating ecological and social values in a conventional chain. This might imply to actually change practices in a market, to improve

sustainability. The fifth and last level addresses the possible impact that the partnership, or effects of the partnership, might have on the political order in the society. Glasbergen (2011) means that this ladder can be used as a model when developing and designing partnerships. Successful partnerships appear to fulfil three criteria: 1) significant environmental benefits 2) significant business benefits 3) “*the potential to create a model that other companies could follow, or that could be followed by the government*” (Glasbergen, 2011, 11).

Nidumolu *et al.* (2014, 5) argue that there are two special characteristics that signify collaborations, which try to create “*systemwide value*”. The first characteristic addresses stakeholder selection: to carefully select stakeholders. A bit controversy to inclusive business but in the other hand affirmed by intersectoral collaborations challenges (Glasbergen, 2011), Nidumolu *et al.* (2014) mean that optimal collaborations often start with a small, selected group of key organizations. Linking self-interest to shared interest, inbuilt structured competition and above all is trust important.

3.6 Summary – a conceptual framework

This section presents a conceptual framework and a summary, based on the theoretical perspectives that are presented in the chapter. **Table 4** summarizes the key concepts in the conceptual framework.

Table 4 Concepts and theories of particular interest

Concept	Theory	Description	Key references
Value chain structures, governance and unique resources	<ul style="list-style-type: none"> Global value chains Value chain analysis 	A value chain's structure and ability to connect to global markets, is explained by the chain's competitiveness, the governance structure as well as the complexity of the product and sector. Value chain processes transforms inputs into outputs and can be divided in primary and support processes. Governance types can be explained by complexity of transactions, capabilities and abilities. Lead firms can explain a chain's ability to adhere to standards and upgrading possibilities.	Gereffi <i>et al.</i> (2006), Kaplinsky & Morris, (2003), Morris & Dunne (2004), Nord (2005), Porter (1985)
Value based chains	<ul style="list-style-type: none"> Sustainable SCM 	The design and management of a chain should promote, enhance, audit and transmit the specific value attributes of the product. Therefore, integration and transmission of information along the whole chain, all the way to the consumer, is critical.	Cousins & Menguc (2006), Karjalainen & Moxham (2013), Pullman & Dillard (2010)
Critical factors for the functioning of value based value chains	<ul style="list-style-type: none"> Value chain analysis Sustainable SCM 	Seamless flow of information, a joint chain vision, a competitive business model which link BOP stakeholders to global chains, marketing, market orientation, market knowledge and compliance to international standards and certifications, are example of critical factors. Business competence and financial abilities are other critical factors.	Macqueen <i>et al.</i> (2008), Purnomo <i>et al.</i> (2014), Trienekens (2012), Van Dijk & Savenije (2009), Wagner (2014)
Sustainable partnerships	<ul style="list-style-type: none"> SD partnerships 	To build a SD partnership, a certain steps are required in the process; mutual trust, collaborative advantages, rule systems (for example certification schemes), external implementation of the partnership and possibility to impact the political order in society. A few number of stakeholders and a careful selection of the stakeholders, is also suggested as important for a sustainable partnership.	Glasbergen (2011), Nidumolu <i>et al.</i> (2014), Van Dijk & Trienekens (2012)

Firstly, value chain theory serves to explain for where and how much value, that is created through each stage of a value chain (Hughes *et al.*, 2014). It is a wider definition than supply chain and includes not only SCM, but also interlinkages with other stakeholders, external factors and global partnerships (Gereffi *et al.* 2006; Hughes *et al.*, 2014; Kaplinsky & Morris, 2003). Value chain activities in a chain are constituted by primary value chain activities, which transform inputs into outputs, as well as support activities, which support the primary activities (Kaplinsky & Morris, 2003; Morris & Dunne, 2004).

The global value chain framework can help to identify critical factors for the functioning of global value chains (Gereffi *et al.* 2006; Kaplinsky & Morris, 2003). To successfully access a global market, a chain must not only be competitive (Porter, 1985) but it also needs the right interlinkages (Kaplinsky & Morris, 2003). When developing and managing a global, value based value chain, the “right” partnerships are even more crucial, to overcome challenges related to value based conditions (Karjalainen & Moxham, 2013). The structure of a global value chain depends on the chain’s competitiveness and unique resources, as well as the governance type (Gereffi *et al.* 2006). The governance type is in turn affected by “*the complexity of transactions, the ability to codify transactions, and the capabilities in the supply-base*” according to Gereffi *et al.* (2006, 98). Complexity of transactions can be related to industry- and product specific attributes. Ability to codify transactions refers to the ability to codify complex transactions, in order to decrease complexity in the chain. Capabilities in the supply base, refers to capabilities of the stakeholders in the supply base.

According to sustainable SCM, it is critical that the design and management of a chain should promote, enhance, audit and transmit the specific value attributes of the product or service (Karjalainen & Moxham, 2013; Pullman & Dillard, 2010). Therefore, integration and transmission of information along the whole chain, all the way to the consumer, is critical. All stakeholders in the chain need to be linked to the end consumers (Cousins & Menguc, 2006).

A literature review shows that appliance to international standards, network vision, market intelligence, two ways seamless information flows, certifications and credence product attributes sustained and transmitted along the value chain, among other factors, are crucial to successfully develop and manage a global, value based value chain (Diniz & Fabbe-Costes, 2007; Macqueen *et al.*, 2008; Pullman & Dillard, 2010; Trienekens, 2012, 53; van Dijk & Trienekens, 2012; Wagner, 2014). Trienekens (2012) suggests that all these factors actually can be derived to three core areas; market access and market orientation, available resources and physical infrastructure, and institutions. Based on the core areas relevant strategies and factors can be identified which can explain and upgrade, the functioning of a global value chain. Several studies emphasize the need for new, unconventional relationships (Karjalainen & Moxham, 2013) and the importance of communication and integration. This leads to the next theoretical field; how to build a SD partnership.

To build a sustainable partnership in a developing value chain, the challenge is to find out which factors that explain why the partnership succeed (van Dijk & Trienekens, 2012). Nidumolu *et al.* (2014, 5) mean that one success factor for SD partnerships, is to start with a careful selection of a few numbers of stakeholders. In particular, trust is important. Glasbergen (2011) means that a number of steps are required to build a SD partnership: mutual trust, collaborative advantages and rule systems by inter alia certification schemes. Further, the partnership must be implemented externally. The last step is to develop a model, which can be possible for others to replicate and which can have an impact on the political order in society.

4 Result of the empirical study

In this chapter, the result of the case study is presented. The first section contains a presentation of the supplying companies. The second section gives a presentation of the sawn wood value chain. Thirdly, a summary of stakeholder's perceived critical factors for the functioning of the chain is presented. Lastly, the development of collaborations in the value chain is presented further. Photos from the field study can be found in Appendix 4.

4.1 Fair Wood Connection

Chile, UK and Sweden, 2007. A small number of consultants in the international consultant cluster SSC Forestry Group, which work with SFM among other things, decide to create their own sawn wood business (pers. mes., Miranda, 2014; pers. mes., van Hensbergen, 2015). The business is given the name SSC Wood Technologies (**SSC WT**). Based on their own experience, they want to create a social project which gives opportunities for small forest owners to increase their income from SFM (pers. mes., Miranda, 2014). A county in Chile; Curacautín, is chosen as location for the company (van Hensbergen, 2013). The region where Curacautín is located has one of the highest proportions of population in poverty in the country and degraded native forests (*ibid.*). The company's mission is to offer wood to international markets, competitive in costs and quality, while adhering to the consultant group's sustainability principles (SSC Forestry, Internet, 1, 2014).

Today, the sawn wood from SSC WT is sold under the brand of the affiliated company Fair Wood Connection (**FWC**). The wood is both FSC- and Fairtrade labelled, due to that SSC WT has been part of a dual labelling pilot project between FSC and Fairtrade (pers. mes., Dumas, I., 2014; FSC, Internet, 1, 2014). Since 2010, the international floor-producer Kährs with base in Sweden has been collaborating with SSC WT. In 2013, Kährs started to offer a floor with the top coat wood from SSC WT to the market (pers. mes., Uhler, 2015). The consultant group Sense Group, which operates in green innovation and environmental driven business innovation, joined the collaboration in 2013 (pers. mes., Kaplan, 2014). Also, the door producing company Bovalls dörrbyggeri is testing characteristics of FWC's wood during 2014-2015, with the aim to possibly produce doors out of the wood (pers. mes., Gustafsson, 2015). Since 2011 when the first batch was produced, SSC WT has shipped seven batches to Sweden, with a total of 122,27 m³ of sawn wood from native species (pers. mes., Dumas, I., 2014). SSC WT has not yet reached break even, mainly due to low demand and start-up challenges (*ibid.*).

The idea behind FWC and SSC WT started as a social innovation, says one of the founders (pers. mes., Miranda, 2014). The three co-founders have been working in the field of SFM for a long time and saw an opportunity to promote SFM and in the same try to improve social conditions for people living of or close by forests. The concept behind the business model is that if small forest owners can earn more from their forests by SFM, they will also get increased incentives to keep their forest and can hopefully also improve their social conditions. FWC intends to be a platform between small forest owners in the global South and consumers in global North which might value and pay for environmental and social attributes of sawn wood (*ibid.*). Given the model; specific characteristic of the sawn wood are soft values such as that forest owners get an income based on Fairtrade principles and promotion of SFM (*ibid.*). A characteristic of the model is that the value chain consists of fewer intermediaries than in traditional forest value chains (pers. mes., Kaplan, 2014; pers. mes., Miranda, 2014). By this, the conceptual model is both a business- and supply chain-model (pers. mes., Miranda, 2014).

4.2 The sawn wood chain from Curacautín

The sawn wood chain from Curacautín, Chile, offers sawn wood out of kiln dried Chilean native hardwood species. These are Roble, *Nothofagus Obliqua*, and Raulí, *Nothofagus Alpina*, with presence in mixed forests, growing in central/south and south of Chile (pers. mes., Araya, 2014). A map that shows the location is presented in Appendix 4 and additional information regarding the species and the Chilean forest sector is provided in Appendix 3. The wood is sourced⁵ from an area around Curacautín, a municipality and small town in the province of Araucanía in south-central Chile. Curacautín is located on the 38th latitude and at about 550 metres above sea level, to the footsteps of the Andes (Municipalidad de Curacautín, Internet, 1, 2015). This is almost 700 kilometres south of Santiago, along the highway Pan Americana Sur and then about one hour east of the highway by car.

Shortly described, the physical flow of wood in the chain is structured as following: logs are sourced from small forest owners outside Curacautín. From the sawmill, the sawn wood is transported by trucks to a port, shipped overseas and transported to the secondary manufacturer Kährs in Nybro, Sweden (pers. mes., Dumas, I., 2014). Kährs delivers a floor made of Roble/Raulí to retailers, tertiary manufacturers or directly to their customers (pers. mes., Uhler, 2015). **Figure 7** shows a schematically illustration of the physical flow.

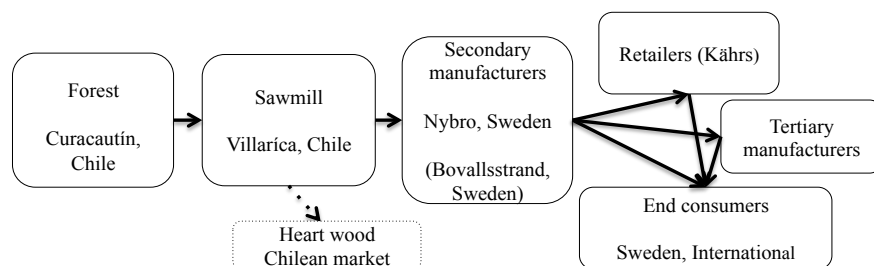


Figure 7. The physical flow of sawn wood in the Curacautín value chain.

The arrows illustrate the physical flow of wood products in the chain. In the following text, the processes and stakeholders in the value chain are described more in detail. “Bovallsstrand” refers to the potential secondary manufacturer Bovalls dörrbyggeri. Information regarding prices of timber and sawn wood, as well as the Fairtrade premium, is presented in Appendix 3.

4.2.1. Sourcing

Private forest owners constitute the raw material suppliers in the chain and they live as well as have their forests in rural areas outside the small city of Curacautín (SSC Americas, Lista Miembros del Grupo FSC Curacautín, N/D). The owners are certified in a FSC SLIMF group, created by SSC WT. At present time, six owners are members of the group, with native forest areas of 12, 15, 19, 30, 50 respectively 0,45 hectares (SSC Americas, Lista Miembros del Grupo FSC Curacautín, N/D; pers. mes.; Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014). They entered the group during 2010 and 2012 (*ibid.*). The forest stands are located approximately fifteen to thirty minutes by car from Curacautín, via access by partially tarmac roads but mostly smaller dirt roads. Chainsaw is used for felling of the logs and four out of five interviewed farmers use oxen to transport the logs out of the forest stands to the landings (*ibid.*). One farmer uses a camion and chain cable. The two prevailing harvesting methods are selective thinning and gap cutting (*ibid.*). Clear cuts of native forest is in general not permitted by the Chilean forest legislation (pers. mes., Araya, 2014; pers. mes., Jarpa, 2014). Natural regeneration is most common, it is

⁵ The geographical area of the forest resources is likely expand in the future; two more owners with forest at other locations are about to join the FSC SLIMF group (Dumas, I., pers. mes., 2014).

very unusual to plant native forest. Before harvesting, forest owners are obligated to have a forest management plan which must be established by an authorized person and approved by the National Forestry Corporation in Chile (CONAF) (*ibid.*). The wood procurement company SSC WT offers the service of establishing forest management plans to the forest owners (pers. mes., Hintz, 2014; pers. mes., Jarpa, 2014).

The forest owners and the wood procurement manager at SSC WT have in several cases had personal contact with each other already before the SSC WT-relation (pers. mes. Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Jarpa, 2014). Timber is sold by a delivering timber contract, where SSC WT and the owners agree about an approximate volume. SSC WT decides the price, which is according to some forest owners higher than what other companies pay. One owner says he can get a higher price/volume for firewood from another company, but he prefers SSC WT due to trust. SSC WT gives advice regarding selection of logs before the harvest (pers. mes., Jarpa, 2014; pers. mes., Corrales, 2014). The owners harvest the forest themselves and SSC WT buys the timber after a final selection of the timber, at the landing (*ibid.*). Payment is transferred immediately, electronically (pers. mes., Hintz, 2014). Dimension requirements are a minimum diameter of 25 centimetres up to approximately 70 centimetres (pers. mes., Jarpa, 2014). The age of cutting is about 30 up to 60 years (*ibid.*) and the length of primed logs around 2,44-2,50 metres (pers. mes., Ramon, 2014; pers. mes., Quidel, 2014). Three of the farmers say that they do not adapt the aim of the forest management specifically for wood sold to SSC WT. The selection of logs is however adapted; by species type, thickness and length. Ramon (pers. mes., 2014) and Quidel (pers. mes., 2014) say that they select logs after what is best for the quality of the future forest stand.

SSC WT is located in Curacautín and the company has no private office (pers. mes., Jarpa, 2014). Two persons work for the company; a forest engineer and an administrative (pers. mes., Jarpa, 2014; pers. mes., Hintz, 2014). Skype, telephone and e-mail are used for communication with the head office in Santiago (pers. mes., Hintz, 2014) which belongs to SSC Americas (SSC A), the South American division of SSC Forestry Group. The forest engineer manages the wood procurement and advisory services (pers. mes., Jarpa, 2014) and the secretary manage and coordinate for instance transportation, certification paperwork and other administrative work (pers. mes., Hintz, 2014). This is done in collaboration with the managing director of FWC, which works at SSC A in Santiago. SSC WT uses a local transportation company to transport the timber to the sawmill, by a truck with crane (*ibid.*).

4.2.2 Primary production

The production processes of sawing, steaming/lixiviation, drying, grading and packaging are outsourced to a sawmill located about 180 kilometres south and about three and a half hour by car from Curacautín, just outside the city of Villarica (pers. mes., Dumas, I., 2014). The sawmill was established in 2007-2008, the yearly production is around 7 500 m³ and it processes both hardwood and softwood (pers. mes., Ruf, 2014). The model to outsource all sawing processes is new for FWC and only one batch has been produced this way (pers. mes., Dumas, I., 2014). SSC WT did previously establish and run an own sawmill in Curacautín, which was shut down in late 2013 (pers. mes., Miranda, 2014). Timber from SSC WT is processed as one batch through the third party sawmill, at the same time, which prevents that the timber is mixed with other sources (pers. mes., Ruf, 2014). The batch from SSC WT also has a designated space in the log yard. The sawing dimension of FWC's sawn wood is 43 millimetres respectively 55 millimetres in different length combinations (*ibid.*). Processing time from the log yard to final product was about three weeks for the first batch. SSC WT's heartwood is bought by the sawmill, which already has a market in Chile by selling pallets out

of heartwood. Residues from the sawmill processes are used for the mill's boiler, which serves with energy to the sawmill and the drying kilns (*ibid.*). From the sawmill, the sawn wood is transported to the port by a contracted transportation company. At the port, the sawn wood is loaded in a container and stored while undergoing a number of tests, which must be met before the container can be shipped (pers. mes., Dumas, I., 2014). Shipping is contracted and paid by FWC/SSC WT (*ibid.*).

4.2.3 Trading, marketing and customer contact

Two stakeholders are involved in trading, FWC and Sense Group. FWC, which consists of consultants from SSC A and indirectly SSC Forestry Group, constitutes the connection from Chile to the global market. Miranda (pers. mes., 2014), Managing Director at SSC A, explains themselves almost as a trader. They manage all the processes in Chile and have direct contact with the forest owners via their affiliated company SSC WT. In the same time, they connect to the Swedish market via Sense Group. Also, the consultants in SSC Forestry Group have been involved in customer contacts, such as with Kährs. The SSC A speaks Spanish and English. Sense Group, which is located in Sweden, takes care of marketing and management of market and customer contacts (pers. mes., Kaplan, 2014; pers. mes., Miranda, 2014). The company has experience in marketing, sales and business development (pers. mes., Kaplan, 2014). One representative at Sense Group is specifically responsible for customer contacts regarding FWC (*ibid.*). The strategy for FWC is both to approach secondary manufacturers, as well as their clients (van Hensbergen, 2015). SSC A and Sense Group try to communicate about once a month or once every second month, often using Skype and e-mail (pers. mes., Dumas, I., 2014). **Figure 8** illustrates a summary of the network of the main stakeholders in the chain; including SSC A and Sense Group.

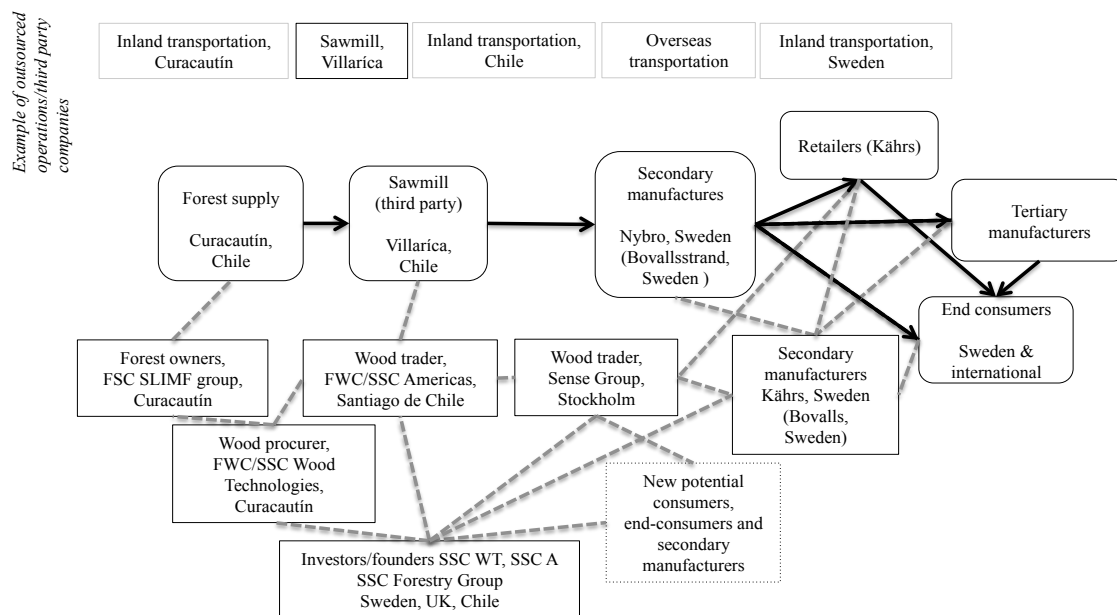


Figure 8. Physical flow and the main stakeholders in the Curacautín value chain.

The physical chain of the sawn wood is illustrated with the black arrows. Dotted lines stand for stakeholder relations. The square boxes in the upper part of the picture give examples of outsourced processes.

4.2.4 Secondary manufacturing

When the containers arrive at a Swedish port, the responsibility is passed over to the customer; the secondary manufacturer (pers. mes., Dumas, I., 2014). At the moment, the chain consists of

the floor producer Kährs and the potential secondary manufacturer Bovalls dörrbyggeri (pers. mes., Gustafsson, 2015; pers. mes., Uhler, 2015). Bovalls is in a product development phase with the wood from Curacautín and has not placed a product on the market yet (pers. mes., Gustafsson, 2015). Both Kährs and Bovalls have used third party transportation to bring containers to their facilities (pers. mes., Uhler, 2014; *ibid.*).

Kährs is so far the only company in Europe that has placed a product out of wood from Curacautín on the market (pers. mes., Kaplan, 2014; pers. mes., van Hensbergen, 2015). The wood is used to the surface course of a 2-strip parquet floor named *Cautin*, produced in a number of different colours. In February 2015, Cautin was no longer included in the product catalogue, but Kährs is still selling the floor on request and will go ahead to renew the FSC- and Fairtrade certifications (pers. mes., Uhler, 2015). The floor has previously been sold also via retailers. Kährs is once in a while contacted by companies or organizations that are interested in samples of the floor, thinking that it might be a good CSR-story for them to procure the Cautin floor (*ibid.*). However, even if it has been a strong interest, the sales were too low to keep the floor in the product catalogue. The floor is produced in Kährs' production facility in Nybro, Sweden, and is transported either by own transportation or by third party companies out to retailers/customers (Kährs, Internet, 1, 2015; pers. mes., Uhler, 2015). Kährs carried out tests of wood characteristics when the floor was developed.

Bovalls dörrbyggeri is located in Bovallsstrand, Sweden and produces exterior and interior doors, mainly for the Swedish and Norwegian market. The company is FSC-certified and is actively searching for FSC-certified hardwood, as part of the company's core philosophy (pers. mes., Gustafsson, 2015). So far, Bovalls has made a test door out of sawn wood from Curacautín, received samples from FWC/Sense Group and are now awaiting test-results regarding wood characteristics. Bovalls got to hear about the dual labelled wood when they were contacted by SSC Forestry Group because of a market investigation (pers. mes., Gustafsson, 2015). Some year later, Bovalls got renewed contact with Sense Group and FWC through an FSC-seminar. The company has a direct selling organization; which means that possible future products of the wood from Curacautín will be sold directly to private or business customers (pers. mes., Gustafsson, 2015). They have deliberately shortened their chain out to the consumers and "*now we're making the same things backward*" says Gustafsson, Sales Manager and Co-owner of Bovalls (pers. mes., 2015).

4.2.5 Resource complexity

"*The forests here could produce gold, but they produce rubbish*" states Araya (pers. mes., 2014), forest engineer at CONAF's office in Curacautín, Chile, regarding native forests in the area. There is potential for high growth rates of the forest, but Araya (*ibid.*) means that the productivity is 10 % out of what it could be⁶. The reasons are plenty and complex (*ibid.*). One is that the national market of wood is more complex than trade of livestock, which causes farmers to choose livestock. Lack of forest management culture amongst native forest owners, national lack of research and development of native forest management/wood processing and complex measurement systems, are other reasons. Sustainable management of native forests is in general not considered as an economical opportunity (*ibid.*). There is no history of managing native forests which means that the existing forests are of low quality in a production-economical perspective. Low quality and low exchange, imply a low income, which further decrease stakeholders' interest in managing native forests in a sustainable way. Furthermore, the forestland is commonly used as crucial pastureland for livestock. Converting to a more production focused forest management, means keeping the livestock out of the forest stands, a

⁶ Background empirics regarding the Chilean forest sector, including average growth rates, are presented in Appendix 3.

shift which often is economically impossible to endure for small holders (pers. mes., Araya, 2014). A former international trader of native wood from Chile also highlights the low quality and complexity of native forest production and trade (pers. mes., Chahin, 2014). Chahin (pers. mes., 2014) and Araya (pers. mes., 2014) stress the importance to find a market for the whole timber; to be able to sell all gradings, not only the best quality. This is a critical to achieve profitability (*ibid.*). Furthermore, no forest owners associations exists in the region and the forest owners are not used to negotiate in a group (pers. mes., Corrales, 2014; pers. mes., Jarpa, 2014). None of the interviewed forest owners speak English and the educational level is low.

4.2.6 FSC- and Fairtrade certifications

As earlier mentioned, the chain is certified under FSC and Fairtrade Labelling Organisations (FLO). The FSC certification is of SLIMF type, which is a special certification for small or low-intensity managed forests (FSC, Internet, 2, 2015). This means that certain auditing processes have been streamlined to reduce costs. The forest engineers at FWC have educated the forest owners and the sawmill, regarding FSC- and Fairtrade requirements (pers. mes., Miranda, 2014; pers. mes., Ruf, 2014). Sustainable resource management and implementation of standards are part of SSC A's main consultant services (SSC Americas, Internet, 1, 2014). The forest engineer at the SSC WT informs the forest owners orally regarding the requirements of the certifications and forest management issues (pers. mes., Jarpa, 2014). The result of the interviews indicate that the forest management that was practised by the forest owners before they became certified, already qualified under several of the environmental requirements according to certain respondents (pers. mes., Araya, 2014; pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Ramon, 2014). One of the forest engineers at SSC A states that it was easy to make the forest owners comply with the certifications requirements, because they already had inbuilt sustainability values related to forests (pers. mes., Miranda, 2014). During the interviews with the forest owners, none talked about "FSC", while however all forest owners had knowledge about Fairtrade (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014). The Fairtrade premium implies that all persons which have been involved in the production, shall receive a premium of 10 % of the market price⁷ (pers. mes., Jarpa, 2014; pers. mes., Hintz, 2014; pers. mes., van Hensbergen, 2015; Fairtrade, Internet, 1, 2015). There is also a calculated minimum sustainable production price, that the sawn wood producer shall receive (pers. mes., Dumas, I., 2014). The secondary manufacturer Kährs underwent processes to get Fairtrade certified by FLO-cert, when they started to collaborate with FWC (pers. mes., Uhler, 2015). Gustafsson at Bovalls (pers. mes., 2015) explains that they were already FSC-certified and want to get certified under FLO-cert as well. This has however not been possible, due to an issue connected to the dual labelling pilot project between FSC and Fairtrade (*ibid.*).

4.2.7 Expressed values

"...So it is a catalyst to me, that if you can bring Fairtrade into the Southern latitude, you create the same synergies for those farmers, that the Swedish farmers went through a hundred-hundred fifty years ago" (pers. mes., Uhler, 2015). This is part of an answer expressed by Uhler, Sustainability Manager at Kährs, at the question of what is enabling/supportive to make the chain work. Gustafsson at Bovalls dörrbyggeri mentions similar reasons to why they think it is important to source from more sustainable sources (pers. mes., Gustafsson, 2015). She tells that it has been incredibly hard to find and procure certain hard wood species from sustainable sources. Bovalls does not perceive much consumer demand on more sustainable produced

⁷ Additional information regarding the dual labelling pilot project and the Fairtrade premium is presented in Appendix 3.

wood. Despite this, they are very engaged about trying to source the wood they import from FSC-certified and more sustainable sources. “*Since we took over the firm, we have tried to learn more because we did not know that much. And we have realised that it is totally lost! But I don’t think people in general in Scandinavia are aware of this*” says Gustafsson (*ibid.*) and refers to the societal use of wood from un-sustainable sources and the deforestation in the global South. Regarding their engagement in sustainable sourcing, Gustafsson (pers. mes., 2015) says: “*We enjoy this and think this important. We try to pass this on, to our customers too*”.

When the farmers are asked about what is important for them with their forests, all of them stress the importance of a forest management which increase both volume and quality of the forest stands (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014). Four of the five interviewed farmers also mention values concerning the protection of the forest, to be able to pass the forests on to future generations and their relation to the forest; “*to let the forest be forest forever*” (pers. mes., Cheuquepan, 2014). All of them would like to learn more regarding forest management, but are restricted by lack of knowledge, time and investments.

4.2.8 Synthesis of stakeholders and processes

In **table 5**, a synthesis of stakeholders and perceived processes is presented. The left column show the stakeholder’s name, the second left the main orientation. Examples of processes are given in the right part of the table.

Table 5 Summary of stakeholders, their main orientation regarding processes and example of processes in the Curacautín chain

Stakeholder	Main orientation	Example of processes		
Forest owners	Forest supply	Forest management	Harvesting	
SSC Wood Technologies (Fair Wood Connection)	Wood procurement, logistics	Establishing management plans	Forest management advice	Management of local FSC SLIMF group
		Logistics	Administration	Wood procurement
SSC Americas (Fair Wood Connection)	Co-founders, creators, wood traders, sawing & drying (outsourced)	Supply management	Trade	Marketing
		Networking	Logistics	Environmental management, certification processes, education
		Concept development	Sawing and drying of wood (outsourced)	
Sense Group (partner to Fair Wood Connection)	Sales, wood traders	Marketing	Customer relations	
		Sales	Networking	
Kährs (Bovalls dörrbyggeri)	Producers, sales	Product dev. & tests	Sales	Market introduction of Raulí and Roble
		Production	Environmental management	
SSC Forestry Group	Co-founders, creators, funding	Networking	Concept development	Expertise
		Funding		

The activities of FWC are executed by SSC A and SSC WT, which belong to the same owner configuration. Therefore, there is a dotted line between them. In practice, this means that the directly involved stakeholders in Chile are the forest owners, FWC and the sawmill. All operations concerning sawing, steaming, drying, packaging etcetera are outsourced from FWC to the sawmill company RF Lumber (pers. mes., Dumas, I., 2014; pers. mes., Ruf, 2014). There

is also the FSC SLIMF group of the forest owners in Curacautín. The group does not meet often and the VC of the group states that they do not have much contact (pers. mes., Corrales Rodriguez, 2014). However, when the FT-premium is about to be paid to involved stakeholders, the group is obliged to meet and approve what each member can use its premium for. Sense Group, which can be defined as a trader in Sweden, is a collaborative partner with FWC/ SSC Forestry Group (pers. mes., Miranda, 2014; pers. mes., Kaplan, 2014). It does not have any ownership in FWC and the SSC companies, or vice versa, but they are working to develop sales of the wood. SSC Forestry Group is the founder of SSC WT. They have been working with networking and customer relations to try to develop the market for the wood (pers. mes., van Hensbergen, 2015).

4.3 Perceived enabling and constraining factors

In this section, perceptions of stakeholders in the chain, regarding what they perceive as critical for the functioning of the chain, are presented. The respondents were asked about what they currently perceive, or have perceived, as supportive/enabling to make the chain work *or* to make their own processes in the chain work. They were also asked about what they perceive as constraining or challenging, as a way to conversely identify enabling factors. **Table 6** presents a summary of critical factors expressed by forest owners in the FSC SLIMF group Curacautín (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014).

Table 6 Critical factors perceived by five forest owners in the FSC SLIMF group Curacautín

Stakeholder	Perceived enabling or supportive factors	Perceived constraining or challenging factors
Forest owners FSC SLIMF Cura- cautín	Trust to SSC WT. Relation with wood procurement manager. Fast payment, honest relation, transparency.	No belief that SSC WT wants to buy more wood, because the procurements are seldom/not continuously/on regular basis.
	SSC WT is the only company which buys sawn wood and is Fairtrade certified.	Lack of land/competition of land use hinder enlargement of forest stand area.
	Higher payment from SSC WT than other companies.	Too low payment/volume for a sustainable income.
	The knowledge that the wood is exported. To be recognized and to feel recognized.	Lack of time and money to develop the forest management. High cost to contract other to work in the forest.
	The premium.	
	That the wood is used to something that lasts.	
	That SSC WT offers training/answers management questions.	

Four out of five interviewed forest owners explicitly state that the trust to SSC WT is very important, to make them want to sell wood to SSC WT (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014). Transparency, honesty and the personal relationship with the wood procurement manager at SSC WT enable this. The premium and that SSC WT is Fairtrade certified is also mentioned. Two of the farmers express that the knowledge that the wood is exported and used for something that sustains, is important to them. At the negative side, several of them mention that they would like to develop their forest management, but lack of technology and time are constraining them. Also, a number of them perceive the irregularity of SSC WT's procurements as negative, they would like to sell more regularly.

Table 7 offers a summary of critical factors perceived by respondents from SSC WT, SSC A and SSC Forestry group (pers. mes., Miranda, 2014; pers. mes., Dumas, I., 2014; pers. mes.,

Jarpa, 2014; pers. mes., Hintz, 2014; pers. mes., van Hensbergen, 2015). Factors stated by respondents from SSC WT is marked with “1”, factors from SSC A is marked with “2” and factors mentioned by the respondent from SSC Forestry Group is marked with “3”.

Table 7 Critical factors for the functioning of the chain, as perceived by respondents from SSC WT, SSC A and SSC Forestry Group

Stakeholder	Perceived enabling or supportive factors	Perceived constraining or challenging factors
SSC WT, SSC A, SSC Forestry Group	The social and environmental values/the social and environmental benefits. ^{1,2,3}	Demand – sales. Match demand with characteristics of all parts of the logs. ¹
	Global network. ^{1,2}	The small-scale. Higher costs. ^{1,2,3}
	The contact with the forest owners. ^{1,2}	Small demand of wood makes it less attractive for forest owners to sell to SSC WT. ¹
	Positive learning process. ¹	Knowledge of industrial processes, e.g. drying. ¹
(Fair Wood Connection)	The FSC and Fairtrade certifications; e.g. Fairtrade premium. ^{1,2}	No local office/no visible logo. ¹
	Customers that value the added value of social and environmental characteristics. ¹	The wood is not known. To be accepted with new wood. The forest industry is reluctant to accept new species. ^{1,2,3}
	Local staff learned very well, easy to train. ²	
	The possibility to create a platform for small forest owners from the South to the North, possible to replicate at other places. ^{1,2}	Wish for a greater role of the state regarding reforestation, exchange – challenging for a small company. ¹
	Customers with close relations to the end-consumers. ²	Old/manual machinery, forest management. ¹
	Customers with internal strategy on forest sustainability; feeling some objectives as a group. ²	Distance to the sawmill. ¹
		Lack of finances/investments. ^{2,3}
	Easy to make forest owners comply with FSC requirements. ²	Lack of production and logistical facilities. ²
		The lack of market. ^{1,2,3}
	The relation between the supply stage and the marketing stage. ²	All the cost in one product. ²
	Can not all the time have insight into the whole supply chain. ²	
	Develop the market by creating demand from customers to secondary manufacturers. ³	Create a trust that the wood works and we can deliver. ²
	Micro and macro politics – e.g. Fairtrade certifications among retailers. ³	Lack of time – to accomplish while we have the interest of the stakeholders. ²
	Having a market that demands the product. ³	Low production capacity, high energy costs, due to lack of boiler and efficient drying kilns. ³

Respondents from all three companies emphasise that they see the social and environmental attributes of the business model, as crucial for the chain (pers. mes., Jarpa, 2014; pers. mes., Hintz, 2014; pers. mes., Dumas, I., 2014; pers. mes., Miranda, 2014; pers. mes., van Hensbergen, 2015). The respondents at SSC WT and SSC A also mention the FSC- and Fairtrade certifications as well as the relation with the forest owners, as important for the functioning of the chain. The local wood procurement manager means that the personal relation with the forest owners facilitates a good relation, and several respondents mention honesty and transparency as important in the relation (pers. mes., Jarpa, 2014; pers. mes., Hintz, 2014; pers. mes., Ramon, 2014; pers. mes., Miranda, 2014). Respondents at the Curacautín-based SSC WT also see the global network and customers that value the added value of the wood as critical. This is similar to the perceptions of the head office, SSC A. SSC A emphasises the sustainability attributes as well as the shorter chain between the forest supply and the secondary manufacturers (pers. mes., Dumas, I., 2014; pers. mes., Miranda, 2014). They mean that finding customers that have internal strategies on forest sustainability, are important. Van Hensbergen (pers. mes., 2015), co-founder of SSC WT, mentions that developing a demand amongst customers to secondary manufacturers, is crucial to find a market. A factor that is emphasised by several respondents is the low/lack of demand (pers. mes., Jarpa, 2014; pers. mes., Dumas,

I., 2014; pers. mes., van Hensbergen, 2014). Furthermore, the small-scale, little financial capacity and wood species that are new to the market are seen as challenges. In the next table, **table 8**, a summary of critical factors perceived by a respondent from the trader Sense Group, is presented (pers. mes., Kaplan, 2014).

Table 8 Critical factors for the functioning of the chain, perceived by Sense Group

Stakeholder	Perceived enabling or supportive factors	Perceived constraining or challenging factors
Sense-group	Commitment and understanding between the sawmill and smallholder group.	Need of a new sawmill and the right entrepreneur to manage the sawmill
	The smallholder origin, if communicated right.	Earlier; a former co-ownership agreement halted development within SSC WT.
	Hardwood characteristics of Roble and Raulí.	Related to external investments: need for more entrepreneurship and business competence at local/“sawmill level” in Chile. Also, the market connection is not in-house in FWC or performed by legal agreement.
	The own mill proved it could produce sawn wood of good quality, competitive with big quality from modern, western mills.	
	The certifications, FSC and Fairtrade.	

Kaplan (pers. mes., 2014) means that the business model with an own sawmill at local level in Curacautín is a positive business case. However, apart from sufficient investments to build an efficient sawmill, there is a need for an entrepreneur with local network, business competence and marketing competence, to run the sawmill. The model of outsourcing the sawmill processes is according to Kaplan (pers. mes., 2014) both too costly and did not give sufficient quality, or as high quality as SSC WT’s own sawmill. In the next table, **table 9**, a summary of critical factors as perceived by the secondary manufacturer Kähns and the potential secondary manufacturer Bovalls dörrbyggeri, is presented (pers. mes., Uhler, 2015; pers. mes., Gustafsson, 2015).

Table 9 Critical factors for the functioning of the chain, perceived by secondary manufacturers

Stakeholder	Perceived enabling or supportive factors	Perceived constraining or challenging factors
Kähns	The story behind the wood.	Limited open-mindedness in the market.
	Exciting project, first of its kind.	Getting acceptance for a new dual label.
	The model of paying more for the wood and create an incentive for forest owners to take care of forests in a sustainable way. Create synergies to farmers in the South, same as what happened in Sweden for hundred-hundred fifty years ago.	Limited support from Fairtrade and FSC.
		To get sufficient volume, correct dimensions, correct specifications and delivery on time.
		Not that strong or good coloration or patterns of the wood.
	Wood was good and performs well.	Little local information/limited marketing material such as video on harvesting, foresters, the area etc.
	Patience and allowance from Kähns to work with the project, even if there were challenges such as not sufficient volumes, wrong dimensions, little local information.	
(Bovalls dörrbyggeri⁸)	The story behind and the shorter supply chain.	Competition from other wood species.
	Good dialog with contact person at Sense Group.	Do not really know the availability yet, in general and regarding bigger dimensions?
	Own engagement.	Possible quality problems in the future?
	The sharing of sustainability knowledge.	
	Positive energy from involved stakeholders.	
	Direct contact with the end consumer makes it easier to tell about sustainability attributes.	

⁸ Bovalls Dörrbyggeri has received a test batch with sawn wood samples. They are awaiting tests results regarding wood characteristics, before they proceed further regarding procurement (pers. mes., Gustafsson, 2015).

Kährs and Bovalls dörrbyggeri strongly stress “*the story behind the wood*” (pers. mes., Gustafsson, 2015) and “*the fantastic story*” (pers. mes., Uhler, 2015) as important factors for the chain. With this, they refer to the idea of paying more for the wood and give forest owners an incentive to take care of the forests in a more sustainable way. Both respondents also mention the engagement of their own company as an enabling factor. Uhler (pers. mes., 2015) tells about Kährs patience to work with FWC/SSC WT, even if it was a lot of delays and challenges. One of the biggest challenges is the open-mindedness of the market; for the wood species and the dual labelling (*ibid.*). The colouring of the wood is a bit different from existing wood species. Bovalls has not procured any wood or sold any doors out of Roble/Raulí yet, but they emphasize the shorter chain backwards and to be able to know the origin of the wood as important factors (pers. mes., Gustafsson, 2015). They mean that their direct contact with the consumers facilitates sales of newer available wood, because they can tell the consumers directly about the sustainability values. They are already selling a door out of another newer wood species without any remarks. For the future, Gustafsson (*ibid.*) thinks it is important with good communication and that the supplier listens to quality and measurement requirements.

4.4 Stakeholder collaborations

This section presents an overview of the development of the chain, as well as further information regarding collaborations in the chain. When the interviewed respondents tell about what they perceive as enabling or constraining factors, they also speak about the development of the chain and how they have tried to overcome challenges or grasped opportunities. **Figure 9** shows a rough timeline over development of the chain.

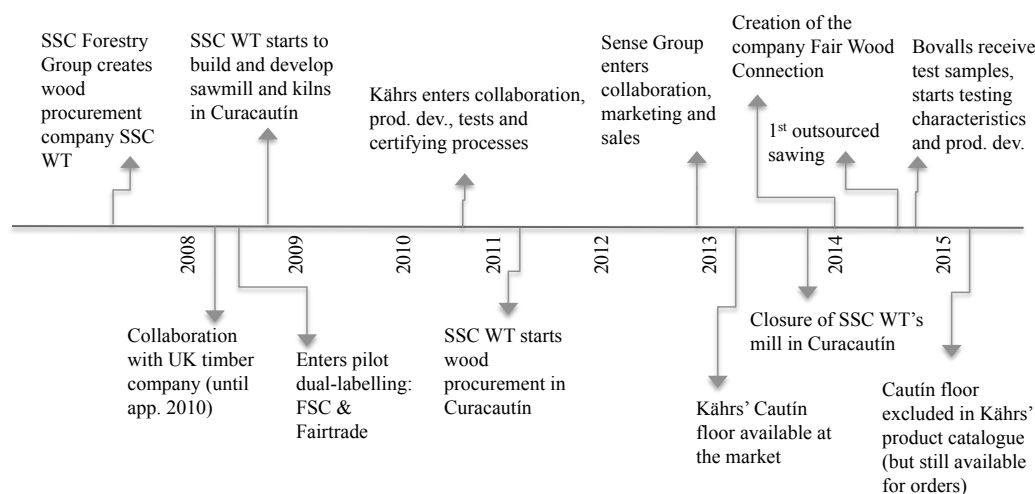


Figure 9. Development of the chain (pers. mes., Miranda, 2014; pers. mes., Dumas, I., pers. mes., Uhler, 2015; pers. mes., Kaplan, 2014; pers. mes., van Hensbergen, 2015).

In the early creation of the chain, during the late 00's, SSC WT had a partner in UK which said they would be able to sell all sawn wood that SSC WT could produce (pers. mes., Miranda, 2014; pers. mes., van Hensbergen, 2015). However, it turned out that no importer or producer in UK could apply for a Fairtrade license. After two years, the UK-customer drew back from the collaboration with SSC WT and SSC WT suddenly stood completely without a customer (*ibid.*). At the same time, Kährs was aiming for an increased sustainability engagement and the sustainability manager at Kährs did therefore establish contact with a number of NGO's (pers. mes., Uhler, 2015). Through one of these NGO's, Kährs' sustainability manager heard about SSC WT and established contact with them. As part of their sustainability engagement, Kährs decided to collaborate and support the chain by procuring wood, developing the floor Cautín

and offer it to the Swedish and international market. Kähns could apply and receive the Fairtrade certification (*ibid.*).

During the initial phase of the chain, SSC WT established, built and ran an own sawmill in Curacautín (pers. mes., Dumas, I., 2014). It was however closed in 2013 and the sawmilling processes became outsourced, a decision taken by SSC A (pers. mes., Miranda, 2014). One reason to the closure was the lack of the right person that could manage and run the sawmill (*ibid.*). Also, the production efficiency and demand was too low, which caused that the sawmill did not reach breakeven (pers. mes., Dumas, I., 2014). The quality of the sawn wood was good but the scale of the drying kilns limited the capacity (pers. mes., Kaplan, 2014; pers. mes., Dumas, I., 2014). Van Hensbergen (pers. mes., 2015) means that high electricity costs and a slow production with too many employees, were reasons to the red figures. More efficient kilns and a boiler were needed to increase the production capacity and lower the costs, but they did not have sufficient funding for that.

In 2013, Sense Group decided to collaborate with FWC. They liked the sustainability aspects behind the FWC model (pers. mes., Kaplan, 2014). Miranda, co-founder of SSC WT (pers. mes., 2014) says *“You need business-oriented people, with business training, who run this kind of projects. The problem we had in the beginning, was that it was a very light difference between creating a business, and running a social project like NGO focus....// So if you have in the team as we had, only technical people with experience in natural development, cooperation with funds, it is very difficult to change the view and trying to think like an entrepreneur. But we learned the lesson and this is the reason to why we today collaborate with Sense, which works with marketing. You need to put the right people in the right places.”* Since its entrance, Sense Group takes care of customer contacts and market development as an independent collaborating partner to FWC (pers. mes., Miranda, 2014; pers. mes., Kaplan, 2014).

Thanks to a previous collaboration, SSC A and the owner of the third party sawmill knew each other since before (pers. mes., Ruf, 2014). Normally, RF Lumber does not perform lego sawing but the relation with SSC A as well as the sustainability approach of FWC, made that RF Lumber took on the sawing (pers. mes., Ruf, 2014). Miranda (pers. mes., 2014) says that she believes that the outsourcing of the sawmill processes allows FWC to concentrate on the storytelling and sustainability values of the sawn wood. This aligns with SSC A's core competences and is also important considering the supply chain model between the forest owners and the secondary manufacturers. For the sawmill processes, technology already exists nationally and can be accessed via outsourcing (*ibid.*). However, not all involved stakeholders might agree with this and some stakeholders think an own sawmill is preferable (pers. mes., Miranda, 2014; pers. mes., Kaplan, 2014). Among other things, due to quality aspects.

Even if many companies and organizations have been interested in the wood from Curacautín, there still has not been a big demand (pers. mes., van Hensbergen, 2015; pers. mes., Uhler, 2015). Miranda (pers. mes., 2014) means that partnerships should be sought with customers which share sustainability values as core values, such as Kähns and Bovalls dörrbyggeri. Van Hensbergen (2015) means that targeting customers to secondary manufacturers are important, to create awareness and demand amongst consumers. Bovalls means that their direct sales design, enables transmission of the sustainability values and therefore also sales (pers. mes., Gustafsson, 2015). Supply wise, collaborations with new forest owners should aim at owners which have sustainability values incorporated in their philosophy (pers. mes., Miranda, 2014). To not constitute a too high pressure per hectare on current certified forest stands, but to still be able to supply a possible higher demand in the future, additional collaborations are sought.

5 Analysis

This chapter aims to analyse the result of the case study by the conceptual framework presented in chapter 3. The analysis follows the structure of the theoretical framework. Firstly, the value chain structure of the Curacautín chain is addressed. Secondly, enabling and constraining factors for the functioning of the value chain. Lastly, how partnerships between collaborating stakeholders have evolved. These sections corresponds to the three research questions; “How is the value chain structured?”, “What do the stakeholders in the chain perceive as critical factors for the functioning of the chain?” and “How has the chain developed since the creation of the chain, with focus on collaborations?”.

5.1 The structure of the Curacautín value chain

The new frontier in value creation for businesses can lay in finding ways to preserve and protect natural resources, while “*unleashing untapped potential*” (Nidumolu *et al.*, 2014, 4). However, creating new types of value chains built on for example Fairtrade conditions, requires new solutions to overcome challenges related to Fairtrade and small-scale conditions (Karjalainen & Moxham, 2013). The conceptual idea behind the Curacautín chain is to improve social conditions as well as stimulate SFM in the global South, by a FSC- and Fairtrade labelled value chain with wood from small-scale forest owners (pers. mes., Miranda, 2014). This has resulted in a model, where the value chain structure and management is a key ingredient in the business model. By using value chain theory and value based SCM theory, this section presents an analysis of the value chain structure of the Curacautín chain.

5.1.1 Value adding processes and unique resources

Aoudji *et al.* (2012) mean that a core element in explaining a value chain is identification of the stages of activities and the geographical dispersion of them. This sub-section explains value-adding processes in the Curacautín chain and connects this to unique resources in the chain. Goes & van Dijk (2013), Hughes *et al.* (2014) and Kaplinsky & Morris (2003) state that processes in a value chain can be seen as primary or support activities. Primary activities transform inputs into outputs. Support activities are processes that support stakeholders in the chain to perform the primary activities (*ibid.*). In the Curacautín value chain, processes such as logistics, sawmill- and secondary manufacture production as well as marketing by Sense Group and Kährs, transform inputs into outputs. Logs become sawn wood, which is vaporized, dried and shipped. It is then processed into parts, which are assembled with other wood materials into for example floors (pers. mes., Dumas. I., 2014; pers. mes., Ruf, 2014; pers. mes., Uhler, 2015). These production processes can therefore be seen as primary activities, by Kaplinsky & Morris’ (2003) framework. But additional processes seem to function as primary activities as well, in the Curacautín chain. Considering the importance that the secondary manufacturers put to the social- and environmental attributes of the wood, processes that create the specific social- and environmental attributes of the chain’s sawn wood, also can be classified as primary. **Table 10** illustrates this concept.

Table 10 Inclusion of new theoretical types of primary value chain processes

	Classical primary activities	“New” primary activities
Example of processes	<i>Logistics, sawmill- and secondary manufacture production, marketing, sales.</i>	<i>Procurement, social- and environmental certification processes. Concept development; a shorter supply chain.</i>

The intangible attributes and the conceptual model behind the wood/the chain, appear as some of the most important product attributes for the secondary manufacturers (pers. mes., Gustafsson, 2015; pers. mes., Uhler, 2015). They emphasize “*the fantastic story behind the wood*” (pers. mes., Uhler, 2015) as an enabling factor for the functioning of the chain. In addition, that the intangible product values are conformed with their own core values and that the Curacautín supply chain is shorter than traditional sawn wood supply chains (pers. mes., Gustafsson, 2015).

If the intangible product attributes are seen as some of the most crucial product attributes, then also the processes that create the crucial attributes are important key inputs in the chain. To develop the intangible attributes, the way of procurement should be seen not only be seen as a support process (Kaplinsky & Morris, 2003) but as a primary activity. Based on this classification and Goes & van Dijk’s (2013, 166) model of a value chain, the forestry to secondary manufacturer stage of the Curacautín value chain can be interpreted as in **figure 10**.

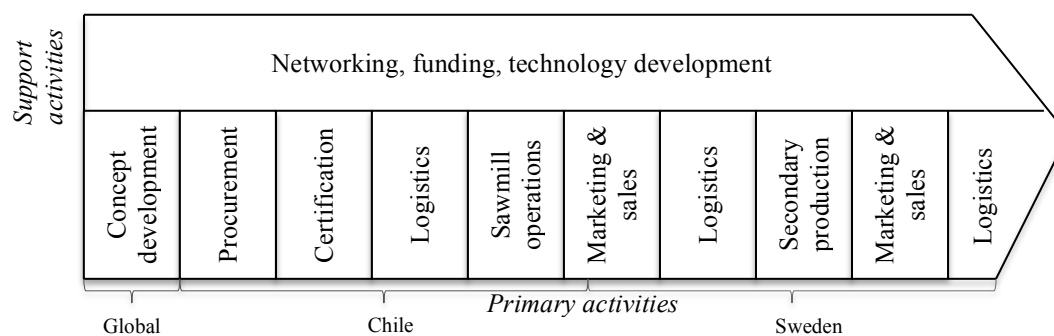


Figure 10. Activities in the Curacautín sawn wood value chain.

The chain stretches from the left to the right, with primary activities in the vertical rectangles and support activities, in the horizontal arrow. Certification processes should also be seen as a primary processes; they do not only support stakeholders to carry out operations, but they are intangible inputs, becoming social- and environmental outputs. For example, the price premium that the forest owners in Curacautín receive, stipulated by Fairtrade requirements (pers. mes., Jarpa, 2014). Geographically; procurement, certification of the forest owners and the sawmill operations, are located in Chile. The major part of the marketing and sales, as well as the secondary production, are carried out in Sweden.

The classification of the activities shows that special value adding processes in the Curacautín chain are not only classical processes but also processes related to evolvement of social- and environmental attributes. To obtain a competitive advantage, optimization of value chain processes are of importance (Porter, 1985). Further, chain competitiveness is a necessary condition to penetrate global markets (Kaplinsky & Morris, 2003). To achieve chain competitiveness, the chain and involved stakeholders should according to Kaplinsky & Morris (2003) focus on relatively unique resources and outsource remaining competences. The results of the empirical study indicate that the unique resources of the Curacautín chain (pers. mes., Gustafsson, 2015; pers. mes., Miranda, 2014; pers. mes., Dumas. I., 2014; pers. mes., Uhler, 2015) are the resources which enable and create the specific sustainability attributes. The summaries of perceived critical factors for the chain show for example perceptions such as “*knowledge in the network*” and “*direct contact with the end consumer*” (pers. mes., Gustafsson, 2015). Therefore, unique resources should be for example the competencies in SFM, communication, networking, storytelling and marketing, which enable creation of the sustainability attributes.

Hansen *et al.* (2014) mean that a chain with a production orientation is signified by a low cost focus and that the forest industry traditionally has been production focused (Nord, 2005) but must become more market oriented. With the sustainability attributes as unique values in the Curacautín chain; the chain focuses on added values rather than a low cost profile, which indicate a market orientation. However, the chain has a lack of demand and try to develop the market, in order to create a demand (pers. mes., van Hensbergen, 2015). The lack of demand can be a sign of a need for an even stronger customer orientation, and/or that the stakeholders in the chain rather want to be market-developers.

5.1.2 Governance structure

The governance is another core element that can explain the structure in a value chain, according to Aoudji *et al.* (2012). To explain why a value chain succeeds to connect to global markets, Kaplinsky & Morris (2003), Morris & Dunne (2004) and Gereffi *et al.* (2006) mean that the governance structure is of high importance. The result of the case study shows that all processes in Chile are currently managed under one company, SSC A (pers. mes., Hintz, 2014; pers. mes., Jarpa, 2014; pers. mes., Dumas, I., 2014; pers. mes., Ruf, 2014). Operations are however carried out by both SSC A, the affiliated company SSC WT and by third party companies, where sawmilling, drying and transportation activities are outsourced (*ibid.*). In Sweden, the existing secondary manufacturer Kähns and the potential secondary manufacturer Bovalls, manage major parts of the value chain; such as transportation, product development, production processes and sales (pers. mes., Gustafsson, 2015; pers. mes., Uhler, 2015). Bovalls has no retailers and has direct contact with its customers (pers. mes., Gustafsson, 2015). From 2015, Kähns has only direct sales of the Cautín floor due to low demand via the retailer sales (pers. mes., Uhler, 2015). Sense Group is also a stakeholder in the chain by serving as a trader in Sweden and by carrying out marketing of the FWC concept (pers. mes., Gustafsson, 2015; pers. mes., Miranda, 2014).

Morris & Dunne (2003) mean that global value chains need specific lead firms that govern the chain to achieve coherence, in order to ensure certification, quality standards and to upgrade the chain. By the definition of lead firms by Morris & Dunne (2003), SSC A can be seen as a lead firm. SSC A manages FWC (pers. mes., Miranda, 2014) and the affiliated SSC WT. SSC A also ensures that the forest owners are certified (pers. mes., Dumas, I., 2014). Information regarding the supply is transmitted via SSC A. Relating to how small-scale value chains typically are structured, global retailers often control the chains (Aoudji *et al.*, 2014; Purnomo *et al.*, 2014; Taylor, 2005). The fact that the secondary manufacturer Kähns needs certain standards of the sawn wood and so far has been the only procuring customer to SSC WT, would imply that Kähns has a lead firm position in the Curacautín chain. However, Kähns appears to have procured wood from Curacautín due the concept rather than perfection in volume, dimensions or delivery on time (pers. mes., Uhler, 2014). Thus, by the lead firm definition of Morris & Dunne (2003), the secondary manufacturer does not appear to be a lead firm.

Gereffi *et al.* (2006) and Kaplinsky & Morris (2003) mean that the type of governance structure, affects a chain's connectedness to global markets. Comparing the characteristics of the Curacautín chain and the governance types established by Gereffi *et al.* (2006, 83), the chain has most in common with the definition of a relational value chain. The stakeholders in the chain seem to have complex interactions, based on trust and personal relations (pers. mes., Miranda, 2014). For example, Kähns is not simply a buyer of FWC's/Sense Group's wood, they also see their engagement in the chain as a sustainability project (pers. mes., Uhler, 2015). Trust is mentioned as an enabling factor by the forest owners to why they sell wood to FWC/SSC WT (pers. mes., Corrales, 2014; pers. mes., Ramon, 2014).

Furthermore, Gereffi *et al.* (2006) mean that three factors explain the governance type; complexity of the transactions, capabilities in the supply base and the ability to codify transactions. In the Curacautín chain, transactions are relatively complex, capabilities in the supply base can be considered as relatively high in some aspects and relatively low in others, and the ability to codify transactions can be interpreted as low. According to Gereffi *et al.*'s (2006, 62) determinants for governance, this also indicates relational governance. To start with, forest product value chains are exceedingly complex, with a number of uncertainties (Hansen *et al.*, 2014; Nord, 2005; Pulkki, 2001). The wood species in the Curacautín chain are new to the Swedish market (pers. mes., Miranda, 2014; pers. mes., Uhler, 2014) which most likely have resulted in longer time for product development and higher marketing costs. A critical condition and challenge to achieve profitability is to be able to sell “the whole tree”; to match buyers’ demand with all gradings and volumes of the wood (pers. mes., Chahin, 2014). Another complexity is the national forest management situation of native forests in Chile (pers. mes., Araya, 2014). Regarding capabilities in the supply base, the capacity of the Curacautín chain appears to vary with different capabilities. For example, the respondents say that challenges are lack of production facilities, lack of finances, lack of in-house marketing competence and to get sufficient volume of sawn wood in time (pers. mes., Kaplan, 2014; pers. mes., Miranda, 2014; pers. mes., Dumas, I., 2014; pers. mes., Uhler, 2015; pers. mes., Huilcal, 2014). At the same time, the stakeholders in the supply base have high capabilities in environmental management systems, SFM, bilingual capacities as well as a global network. Regarding abilities to codify transactions in the chain (Gereffi *et al.*, 2006), these are interpreted as relatively limited in present time. The local situation of native forest management, quality and exchange, matched with the demand of the secondary manufacturers, appear to be difficult to codify due to the complexity and range of different factors that affect the chain.

5.1.3 Value based SCM

To successfully build a value based chain, the SCM and supply chain design must reinforce the unique values all the way to the consumer (Cousins & Menguc, 2006; Karjalainen & Moxham, 2013; Pullman & Dillard, 2010). To reinforce the values, integration is a key design issue; all stakeholders in the chain need to be linked to the end consumers. Information flows, material flows and relationships must be integrated (Power, 2005). The result of the study shows that the supply chain has relatively few stages and few involved intermediaries (pers. mes., Miranda, 2014; pers. mes., Jarpa, 2014; pers. mes., Uhler, 2015). The secondary manufacturer Kähns has previously procured the wood directly from SSC A in Chile and performs since 2015 direct sales of the Cautín floor (pers. mes., Uhler, 2015). They ended sales via retailers due to low demand. Bovalls communicates directly with their consumers, which they mean will help facilitate introduction of the wood from Curacautín (pers. mes., Gustafsson, 2015). Sustainability values are transmitted by certifications and the “story behind”; marketing carried out by FWC/SSC A, Sense Group and in the prolonging Kähns and Bovalls. However, information does not appear to flow seamlessly, for example between the forest owners and the secondary manufacturers. The secondary manufacturers request more information regarding the production in Chile (pers. mes., Uhler, 2014; pers. mes., Gustafsson, 2014) and says that the dimensions of the sawn wood has been wrong (pers. mes., Uhler, 2014). Given these facts, the chain is relatively integrated, but there are still issues that are less integrated in the chain, such as information and adherence to dimension and volume requirements (*ibid.*).

Pullman & Dillard (2010) argue that assurance of proper input values and systems to engender, support and transmit quality and credence attributes are important for a value based chain. Empirical signs of this in the Curacautín chain which can be seen as ways to ensure proper

input values, are adherence to FSC- and Fairtrade certifications (Lista Miembros del Grupo FSC Curacautín, N/D; pers. mes., Dumas, I., 2014) and the personal relation between the wood procurement manager at SSC WT and the forest owners (pers. mes., Jarpa, 2014). The certifications and the marketing regarding “the story behind” can be seen as means of transmission of credence attributes along the value chain. This indicate that four out of the five bullets from the bullet list with findings from Pullman & Dillard (2010) appear fulfilled, even if perhaps not fully. A reward system that links product characteristics seems to be lacking in the forestry- sawmill stages.

5.2 Perceived critical factors for the functioning of the chain

The literature summaries regarding reported critical factors for the functioning of value based value chains, show a wide range of factors which affect the functioning and ability to connect to global markets (Auodij *et al.*, 2012; de Boer *et al.*, 2012; Diniz & Fabbe-Costes, 2007; Karmann *et al.*, 2009; Macqueen *et al.*, 2008; Pullman & Dillard, 2010; Purnomo *et al.*, 2014; Seuring & Müller, 2008; Taylor, 2005; Trienekens, 2012; Van Dijk & Savenije, 2009; van Dijk & Trienekens, 2012; Wagner, 2014). These derive from both internal as well as external factors (Trienekens, 2012). The result regarding perceived critical factors in the Curacautín chain also displays a wide range of different factors. Noteworthy is that almost all enabling or supporting factors derives from internal factors, related to the stakeholders in the chain. Overall, the conceptual model and the sustainability values, the network, stakeholders’ own engagement, the short supply chain, knowledge, the certifications and trust; stand out as enabling or supportive factors (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Ramon, 2014; pers. mes., Hintz, 2014; pers. mes., Dumas, I., 2014; pers. mes., Gustafsson, 2014). A majority of the perceived enabling/supportive factors appear in fact connected to: 1) The conceptual model behind the chain and the sustainability values 2) Stakeholders’ engagement to these values and belief that these issues are important 3) The global network with the united knowledge, positive relations and the connection between the supply and secondary manufacturing stage. None of the interviewed stakeholders explicitly mention own abilities and capabilities; such as knowledge in SFM or abilities to test and develop a floor out of “new” wood species. In order to create and develop a chain like this, these abilities are likely of high importance too, relating to Kaplinsky & Morris (2003), Gereffi *et al.* (2006) and Porter (1985).

The challenging or constraining factors derive from both internal and external factors. The small-scale, lack of demand, lack of finances to invest in efficient production facilities and national lack of focus of native forest development, appear to be related a combination of internal/external factors. Lack of market demand, challenges related to the market’s perception of new wood species and the slight pink tone of the wood, challenges related to a low production capacity, lack of sufficient financial capabilities and lack of the right person to manage a local sawmill in Chile, appear as main constraints and challenges to the chain (pers. mes., Quidel, 2014; pers. mes., van Hensbergen, 2015; pers. mes., Uhler, 2015).

Trienekens (2012) claims that different factors which enable or constrain a global value chain, in fact derive from three comprised areas; market access and orientation, available resources and physical infrastructures, and institutions. A categorization of the perceived enabling/supportive factors in the Curacautín chain according to the three areas, indicates that factors can be found in all areas. However, a slightly higher number of enabling factors relate to available resources, physical infrastructures and institutions. It also exists factors that do not appear to match into the three areas; factors that relate to the concept model behind the chain

and relational structures. Constraining or challenging factors can also be found in the three areas (Trienekens, 2012), but with overweight to market access and market orientation, by factors such as the small-scale, technological capabilities, bargaining power and lack of demand (pers. mes., Dumas, I., 2014; pers. mes., Uhler, 2014; pers. mes., Miranda, 2014; pers. mes., Jarpa, 2014).

To summarize regarding supportive/enabling critical factors in the Curacautín chain;

- Almost all are internal to the chain.
- They appear to be related to three main areas: 1) The conceptual model of the chain/the business model 2) Involved stakeholder's values and engagement in these questions 3) A global network with positive relations.
- They can also be derived from all three of Trienekens (2012) core areas, but with predominance to available resources and physical infrastructures, and institutions. Conversely, a higher number of the challenging/constraining factors, can be derived from Trienekens (2012) core area of market access and market orientation.

5.3 Development of collaborations

In order to address challenges related to value based value chains, several authors mean there is a need for unconventional partnerships, to overcome challenges and create systemic value (Karjalainen & Moxham, 2013; Nidumolu *et al.*, 2014; van Dijk & Trienekens, 2012). To start with, the Curacautín chain has elements of both intersectoral partnership and B2B partnerships, by Glasbergen's (2011) definition. Several stakeholders in the chain are from the private sector, but they started to develop SSC WT with the view of a social project (pers. mes., Miranda, 2014). Kährs engaged as a CSR-project; to be a part of a catalyst which can promote SFM in the global South (pers. mes., Uhler, 2015). According to the stakeholders their engagement is due to an ambition to improve life of people and promote SFM, rather than a strategic diversification of their own businesses. Today, Miranda (pers. mes., 2014) says that they have been forced to transform the social-project thinking into a more business-oriented thinking and have strengthened the entrepreneurial abilities in the chain by collaborating with Sense Group. Regarding intersectoral partnerships, collaborations with for example FSC and FLO add intersectoral elements to the chain.

Glasbergen (2011) and Nidumolu *et al.* (2014) mean that a number of conditions need to be fulfilled in order to reach a sustainable partnership. Trust is the first step (Glasbergen, 2011). Collaborative advantages, fairness of distribution, rule system and a broader external implementation of the partnerships are other steps. **Table 11** at next page presents empirical signs of these steps in the Curacautín chain.

The result of the case study shows indications of trust as a key factor. The forest owners state that they have trust in SSC WT and that this is a reason to why they sell wood to them (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014). The founders of the chain have a long history of working together and they founded SSC A together as well (pers. mes., Miranda, 2014; pers. mes., van Hensbergen, 2015). Two of the founders have been investing financially in facilities, while SSC A was managing the facilities and took the leading decision to shut down the own sawmill according to Miranda and Dumas, I. (pers. mes., 2014; pers. mes., 2014); another sign of trust.

Table 11 Fair Wood Connection partnerships by "the partnership ladder" (Glasbergen, 2011)

	Trust	Collaborative advantage	Fairness of distribution	Rule system	External implementation
Empirical signs in the Curacautin chain:	<ul style="list-style-type: none"> • Forest owners' selling to SSC WT. • History of working together. • Mutual agreed sectioning of processes between separate businesses. 	<ul style="list-style-type: none"> • Upgrading of the chain/increase of total value chain capabilities. • Possibility to engage in activities considered as stimulating. • Expanded network. 	<ul style="list-style-type: none"> • N/D⁹. • Inbuilt condition of 10 % market price premium to producers & calculated sustainability production cost 	<ul style="list-style-type: none"> • FSC-certification. • Fairtrade-certification. 	<ul style="list-style-type: none"> • Marketing of the model to NGO's, private sector, public sector. • Involvement in FSC- and Fairtrade's pilot project.

As for collaborative advantages, three suggestions of interpretations of collaborative advantages are given. Firstly, Miranda (pers. mes., 2014) mentioned lack of entrepreneurial thinking in the team as a reason to the collaboration with Sense Group. Collaborating with a new stakeholder becomes a way to upgrade the chain. Two slightly longer deductions are that the interdisciplinary partnerships enable the possibility for involved stakeholders to work with questions that they consider important and stimulating. And lastly, by expanding the network each stakeholder can become more competitive. Regarding fairness of distribution, no analysis of value chain distribution is carried out in the study and therefore are no interpretations made regarding this. So far, the sawmill owned by SSC WT has only had red figures (pers. mes., Dumas, I., 2014) and the last batch sent to Bovalls, consisted of samples. The distribution in the chain is however regulated after Fairtrade's requirements, with among other things a premium of 10 % of the market price which goes back to the producers and thereby the forest owners (pers. mes., Jarpa, 2014; pers. mes., van Hensbergen, 2015). For rule systems, the chain has the certifications requirements from FSC- and Fairtrade to comply to. Examples of external implementation are networking, marketing of the conceptual model and participation in FSC's and Fairtrade's dual labelling project.

Not directly related to the above partnerships ladder stages, but noticed in the result of the empirical study, is the fact that almost all interviewed stakeholders express sustainability values as an enabling factor (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014; pers. mes., Dumas, I., 2014; pers. mes., Uhler, 2015; pers. mes., Miranda, 2015; pers. mes., Gustafsson, 2015). Mutual values regarding sustainability seem to be a crucial enabling factor. The interviewed stakeholders describe difficulties and challenges during the time that they have been involved in the chain (*ibid.*). The founders started to work with the chain in the late 00's and it could be said that the chain is still in development, with challenges regarding market demand (pers. mes., van Hensbergen, 2015). Despite this, they continue to work with the chain and a new collaborator might have entered in Bovalls. Almost all interviewed respondents mention, how important they think it is to try to keep the forests and the social and environmental attributes of the model, as a crucial reason to why they want to work with the chain (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014; pers. mes., Dumas, I., 2014; pers. mes., Uhler, 2015; pers. mes., Miranda, 2015; pers. mes., Gustafsson, 2015). Stakeholders that are sharing mutual values regarding sustainability seem to be a key-explaining factor for collaborations in the chain.

⁹ SSC WT sawmill did not reach break even/did not make any profit and after that, only one container with test samples has been shipped to Sweden (pers. mes., Dumas, I., 2014). Analysis of the value distribution along the chain is not carried out in this study.

6 Discussion

In this chapter, the result of the analysis is discussed and compared with the literature previously presented in the thesis. The chapter is structured after the three research questions; in section 6.2 is “How is the value chain structured?” addressed, in section 6.3 “What do the stakeholders in the chain perceive as critical factors for the functioning of the chain?” and in section 6.4 “How has the chain developed since the creation of the chain, with focus on collaborations?”. Additionally, this chapter starts with a discussion regarding the quality of the study’s result and the generalizability of the result.

6.1 Analytical generalizability and quality of the result

As previously mentioned in the method chapter, the result of this study is not statistically generalizable to a greater number of value based value chains. The transferability of the result is limited by a deep understanding of contextual factors for other value chain conditions.

However, Yin (2009) argues that analytical generalization is possible; to compare if the result of this study correspond or diverge with previous studies and the theoretical framework. The quality of the result in this study, in relation to the aim, should be of relatively high quality due to the chosen research design and method presented in chapter 2. Yet, there is a risk that definitions can be perceived differently and that institutional factors affect the interpretation of the result. The respondents’ answers might be affected by the non-anonymity and the fact that the study is presented openly. Also, this study grasps only some aspects of the studied phenomenon. The study is delimited to the forestry to secondary manufacturer stage. To fully study the functioning and success of a global value chain requires many different theoretical fields and this study merely uses value chain theory, sustainable SCM and partnership theory. As well, within value chain analysis, this study covers some aspects, but not all. The choice to include more theories than only value chain theory, delimits the study from further steps in value chain analysis, but it gives the possibility to grasp value based aspects and critical partnership issues. To include FT aspects into a value chain framework is supported by for example Karjalainen & Moxham (2013). Suggestions for future research, which is found in next chapter, includes analysis of value chain distribution and financial analysis.

6.2 A value based value chain structure

The findings in this study show that the structure of the Curacautín value chain is strongly connected to the conceptual idea behind the chain; the value based business model of the sawn wood producer in Chile. The supply chain between the forestry stage and the secondary manufacturer stage is on purpose relatively short. Furthermore, key value chain processes are not only traditional value chain activities such as physical production, marketing and sales, but also procurement of timber, social- and environmental certification processes and concept development. The latter processes appear to be primary value chain activities; by creating value based attributes of the sawn wood which the secondary manufacturers see as the unique key attributes of the wood and as a reason to procure the sawn wood.

Goes & van Dijk (2013) and Kaplinsky & Morris (2003) mean that procurement and certification activities are support activities in a value chain and not primary activities, as suggested above. However, by using Kaplinsky & Morris’ (2003) definition of what can be defined as a primary processes, the analysis in this study shows that the procurement and certification processes in the Curacautín chain constitute primary activities and *not* support

activities. In this value based chain, activities that create and engender the specific sustainability attributes are primary activities. Thus, this contradicts Goes & van Dijk's (2013) and Kaplinsky & Morris's (2003) model of what processes that are primary and support processes in a value chain. This indicates that the traditional value chain model needs to be adapted in order to describe a value based chain, such as the one from Curacautín.

Furthermore, the findings regarding procurement and certification activities as primary activities in the value chain are in accordance to with Porter's (1985) and Kaplinsky & Morris' (2003) theory that a chain should focus on relatively unique resources. By extension, the theory that a chain should focus on relatively unique resources to achieve competitiveness, can support the Curacautín value chain structure with outsourced sawmill processes. On the other hand the outsourcing of the sawmill processes brings in more stakeholders which might increase the challenge to have an integrated chain, which Power (2005) and Pullman & Dillard (2010) argue is critical for the functioning of value based chains.

Further findings regarding the structure of the chain, are that the chain appears to have a relational governance structure. The result comply both with Gereffi *et al.*'s (2006) description regarding such chain as well as the key determinants which explains a relational governance (Gereffi *et al.*, 2006). The governance appears to be carried out by close relations built on trust, such as the relation between the forest owners and FWC. An exception from Gereffi *et al.*'s (2006) framework is however that the capabilities in the supply base of the Curacautín chain are not solely high; some capabilities are relatively low. Either, this can be a theoretical explanation to some constraints in the chain; that relatively low capabilities in certain areas are insufficient to govern the complex transactions. Or, it can be an indication that this governance structure is not signified by as clear-cut determinants as the theoretical model proposes. In a broader perspective, the need for stakeholders with capacity to manage complex transactions conforms to critical factors reported in the theoretical framework, such as business competence and financial capabilities (Macqueen *et al.*, 2008; Trienekens, 2012). Also, the governance structure with trust as an element is consistent with Glasbergen (2011) and Nidumolu *et al.* (2014) regarding the importance of trust in SD partnerships. However, the informal structure of the chain might perhaps constitute a constraint to acquire external investments. Those usually require formal structures – and the empirical result shows a lack of investments and a relational governance. If so, not only trust in a SD partnership but also formal agreements are important for the functioning of the value based chain.

The analysis shows that SSC A can have a lead firm role in the chain, by managing all value chain processes in Chile and constituting the only information link to and from the forest owners. Morris & Dunne (2003) mean that global value chains need specific lead firms to achieve coherence in order to fulfil certification standards and to upgrade the chain. The result of this study are in line with Morris & Dunne's (2003) statement; the forest owners in Curacautín would probably not have become FSC- and Fairtrade certified without SSC A. SSC WT's sharing of SFM knowledge to the forest owners can be seen as a chain upgrading. By no doubt, not only the competitiveness of the chain but also the interlinkages are critical for the chain's ability to connect to global markets, as stated by Kaplinsky & Morris (2003) and Gereffi *et al.* (2006). The forest owners would have low abilities to connect to global markets without the bilingual abilities, abilities to create a strong sense of urgency by storytelling and the global network of SSC A. In turn, Sense Group increases the market intelligence in the chain and by that, SSC A's abilities to connect to the Swedish market.

The supply chain structure of the Curacautín chain conforms on several aspects with the key features and attributes regarding sustainable SCM, stated by Cousins & Menguc (2006), Karjalainen & Moxham (2013), Power (2005) and Pullman & Dillard (2010). The deliberately short supply chain between the forest owners and the secondary manufacturers should facilitate transmission of the sustainability values, due to the fewer stages and stakeholders to integrate. The FSC- and Fairtrade labels can help transmit the intangible values both to the consumers and the small-scale forest owners. A difference is however that the studied stages of the Curacautín chain do not have a joint reward system, which link material ownership with desired product characteristics. The fact that challenges related to volume and measurements exist in the chain, can support Karjalainen & Moxham's (2013) and Pullman & Dillard's (2010) statements regarding the importance of a quality reward system.

Another important aspect of the value chain structure is the fact that if the chain would not have the processes which create or transmit the sustainability attributes, it would most likely lose its unique sustainability resources and therefore its competitive advantage. This is in line with Karjalainen & Moxham (2013) and Cousins & Menguc (2006) which argue that a value based chain's specific values, must provide the context to the chain and be reinforced along the chain. Also, as in this case when the unique attributes are intangible, communication is critical because it is the only way to "show" the intangible attributes. In a wider perspective, these aspects align with theories of Rainey (2010) and Ottoman (2011) regarding sustainable business development. Regarding the importance of integration in a chain according to Karjalainen & Moxham (2013) and Power (2005), statements from some respondents support the importance of relationships and information flows. For example, the secondary manufacturers wish for more information regarding the forest owners. Challenges related to volume and measurements exist and it is important to find a market for all qualities of the sawn wood; two-way integration should therefore be critical for a functioning chain. Also, increased information might enhance even stronger relations, which might reinforce the sustainability values further and therefore also the functioning of the chain.

In contrast to traditional sawn wood chains (Hansen *et al.*, 2014; Nord, 2005) the Curacautín value chain appears to have a market-orientation, by the value added focus. This is in line with Hansen *et al.* (2014) call for market orientation to develop the forest industry. However, the lack of demand for the Curacautín chain and the reluctance of the market to accept the new species, might indicate a need for an even stronger market orientation. Or, that it is problematic to promote the sustainability attributes amongst retailers, which is discussed further in next section. Also, it can indicate that the stakeholders in the chain consciously take a role as a market-developer as part of that they see their engagement as a CSR project and to implement their SD values.

Lastly, it can be concluded that the structure of the Curacautín value chain does not align with the structures of the small-scale sawn wood value chains presented by Aoudji *et al.* (2014), Purnomo *et al.* (2014) and Taylor (2005). The structure of the Curacautín chain differs by having fewer intermediaries, by having a producer -FWC- that also is a global intermediary and by not being governed by big retailers.

6.3 Critical factors for the functioning of the chain

The findings show that most perceived enabling factors in the Curacautín chain are related to factors internal to the chain, connected to the conceptual model of the chain, values of the involved stakeholders and the global network that the stakeholders form. Also, a majority of the

enabling factors relates to Trienekens (2012) core areas of available resources, physical infrastructures and institutions. The sustainability attributes of the sawn wood and the values of the involved stakeholders, appear as critical success factors for the functioning of the chain. Thus, both core operations that creates the sustainability attributes and marketing, which transmits these attributes and creates a brand with an image of sustainability concerns -Fair Wood Connection-, should be especially critical for this type of chain. Adding the perceived lack of demand; the importance of the brand and marketing appear even stronger. These findings conform to a number of the presented literature regarding critical factors; Auodij *et al.* (2012), Pullman & Dillard (2010), Trienekens (2012) and Wagner (2014).

Though, only one stakeholder in the chain owns the FWC brand while it should be critical that all stakeholders in the chain tell “the story behind” in order to successfully transmit the specific sustainability attributes along the whole value chain. This might be challenging to achieve for example among retailers, like amongst Kährs’ retailers. Furthermore, some stakeholders might be investing time in a brand that they have no legal agreement to. In the prolonging, this should increase the need of integration and information sharing to enable efficient marketing of the brand by different stakeholders. Furthermore, two way information flows are important. This is in accordance to for example Diniz & Fabbe-Costes (2007), Macqueen *et al.* (2008) and Seuring & Müller (2008).

In general, the findings conform to the presented literature regarding critical factors for the functioning of value based value chains. Either, by fulfilling presented enabling factors or by showing challenges related to enabling or constraining factors. The findings are in line with Auodij *et al.* (2012), Karmann *et al.* (2009), Macqueen *et al.* (2008), Taylor (2005), Van Dijk & Savenije (2009) and Wagner (2014) which mention enabling forest specific factors such as emphasising seamless communication, marketing, certifications, network vision and financial incentives to SFM. Conformance can also be seen according to Diniz & Fabbe-Costes (2007), Pullman & Dillard (2010), Seuring & Müller (2008), Trienekens (2012) and van Dijk & Trienekens (2012), regarding sustainable SCM. However, the results in this study have a stronger focus on shared sustainability values and engagement amongst the stakeholders in the chain, than the reported literature. This suggests an addition to the theoretical framework, with shared sustainability values and inbuilt sustainability engagement as two important, critical factors for the functioning of the value based chain from Curacautín.

Regarding constraining factors, the identified perceived constraints are partly consistent with the presented literature; Diniz & Fabbe-Costes (2007), Kaplinsky & Morris (2003), Karmann *et al.* (2009), Macqueen *et al.* (2008) and van Dijk & Trienekens (2012) which reports factors concerning global conformance requirements, communication, limited capital investments, available volume and lack of motivation amongst consumers. Lack of demand is perceived as a main constraining factor. One aspect of the lack of demand can be related to that the wood species are new to the market. In a way, the use of wood species that are new to the market likely raises the threshold to connect to the market. Perhaps a market introduction with better-known species and establishment of the brand, before introducing species that are new to the market, can facilitate the initial connection to the market. However, lack of market information does not appear as a critical factor in the Curacautín chain, in contradiction to Auodij *et al.* (2012) and de Boer *et al.* (2012). This is likely explained by the collaboration between FWC and Sense Group. The lack of demand can therefore probably not be explained by lack of market information. Lastly, the results indicate the importance of having *adequate knowledge in each stage* of the value chain; the right stakeholder at the right stage, for a functioning value chain as a whole.

6.4 Development of collaborations

Nidumolu *et al.* (2014) and van Dijk & Trienekens (2012) argue that with whom and how collaborations are built, is critical for the functioning of a value based value chain and therefore also a key step to reach systemwide value creation. Based on the presented development of the Curacautín chain, it appears that challenges that have existed or exist in the chain often are met by collaborations, with prospects to upgrade the chain. To connect small forest owners in Chile with the global market, SFM consultants with a global network formed SSC WT and FWC. The company Kährs was looking for stakeholder dialogue and got in contact with the consultant network; which resulted in that the SSC WT received the first, important customer that placed a product out of the wood on the market. By the collaboration with Sense Group, the chain got increased business- and marketing competence. With a possible future partnership with the potential secondary manufacturer Bovalls dörrbyggeri, which has direct sales as core operations, the chain might find a “new” way to enhance transmission of sustainability values.

What can explain the collaborations in the Curacautín value chain? Van Dijk & Trienekens (2012, 22) mean that a critical factor for partnerships in value chains is to find out which factors that explain why the partnerships succeed. In the Curacautín chain, empirical examples are identified which can be related to all steps in Glasbergen’s (2011) partnership ladder. Also, the importance of trust and the fact that the chain involves a relatively small, selected group of stakeholders, which conforms to Nidumolu *et al.*’s (2014) statements. However, one of the strongest factors that can explain collaborations in the Curacautín chain, appear to be the mutual sustainability values of the involved stakeholders. They perceive the conceptual model of creating a platform for SMFEs in the global South, together with their own engagement for SD, as critical enabling factors for the functioning of the chain. The mutual sustainability values appear to bring patience and dedication amongst the stakeholders. In turn, patience and perseverance appear critical for the collaborations and also the chain, considering the challenges with for example demand, measurements and funding. The result indicates that the stakeholders’ perspective of their role in the chain, might bring more patience for challenges and long development times, than in traditional B2B collaborations. Therefore; a shared network vision of sustainability values, appear to be one of the most important enabling factors for the collaborations in the Curacautín value chain.

Furthermore, the secondary manufacturers do not appear to collaborate due to a direct, high demand from their customers regarding more sustainably sourced wood, but rather to other reasons. They mention their own sustainability values and the view of this as a CSR project. In a short term, the engagement can be used to communicate a concrete example of a sustainability engagement; to promote an image of sustainability. Also, sourcing from a shorter value chain with knowledge of the source is a way to reduce risks. For Bovalls, the sourcing is a way to implement their business model of a short chain, also backwards in the chain. In the long term, the stakeholders appear to collaborate and engage in the chain, due to an ambition to have an impact on the political order in the society. Which is to promote SFM, to develop the market in order to create a demand and to spread the platform for small forest owners in global South. Several stakeholders appear to see their engagement as a role to “tell the story”, to make a market. This is also the last step in the partnership ladder by Glasbergen (2011). In a long term, it might bring benefits such as a big business network, which in a future can give for example more contracts and business benefits. Nevertheless, the intentions to affect the political orders in society imply a long time perspective.

7 Conclusions

The new frontier in value creation for businesses may lie in new ways to combine economical, social and environmental sustainability to preserve and protect natural resources. Creating new kinds of value chains to reach this frontier and to achieve systemic value, have however shown to be complicated. Much work remains to explain how value based chains are structured and why some chains succeed to create global value based chains, when others fail. The aim of this study is “to explain the development of a global, value based, small-scale sawn wood chain”. This is done by focusing on identification of enabling factors for the functioning of the chain. In this chapter, conclusions of the study are presented in order to address the aim. Suggestions for future research are also given.

7.1 A value based brand and mutual sustainability visions

To successfully connect to global markets, a value chain must not only have an overall competitiveness but also a governance structure that enables global connections. Adding sustainability values to this concept and requirements from social- and environmental certifications, this implies that the chain should be structured and managed to create, sustain and transmit the sustainability values. In the Curacautín value chain, the value chain structure is strongly connected with the conceptual model behind the chain; the business model of the sawn wood producer. Due to the structure of the value chain, the chain can reinforce the values of the conceptual model; which together create the sustainability attributes that are unique to the chain and its sawn wood products. Involved stakeholders perceive these sustainability attributes as some of the strongest enabling factors for the functioning of the chain and the ability to connect to global markets.

The value chain comprises relatively few and relatively tightly connected stakeholders. One stakeholder manages all processes in Chile and a collaborating partner in Sweden carry out marketing and act as a trader, between the supplier in Chile and the secondary manufacturers in Sweden. The sawmill processes are at present time outsourced and an affiliated company carries out the procurement of timber. Primary value chain activities are not only classical primary activities such as sawmill and marketing processes; this study found that also procurement and certification processes are important primary activities in the chain. The findings show that the unique attributes of the chain are the sustainability attributes; these are a main reason to the secondary manufacturers' interest in the chain. Thus, this thesis suggests that the activities that create, support and transmit these attributes along the chain should be seen as critical primary processes, for the functioning of the chain. This indicates that the traditional value chain model of primary and support activities perhaps might need to be adapted to value based value chains.

Concerning the governance of the chain, the findings show characteristics of a relational value chain, where complex transactions – disassembly and assembly of raw material, as well as many uncertainties – are managed by a relational governance type. Governance appears to be carried out by trust and personal relations. The structure can be explained by the complex transactions, relatively low possibilities to codify transactions, and relatively high as well as low capabilities in the supply base. A majority of the perceived enabling factors in the chain are related to internal factors, connected to the conceptual model of the chain, stakeholders' own engagement and values as well as the global network with positive relations. Perceived challenging factors are among other things lack of demand, wood species that are relatively

unknown to the European market, lack of production capacity caused by limited financial capabilities, as well as challenges to find the right stakeholder to manage a local sawmill.

The result indicates that the chain has a market orientation, in contrast to traditional sawn wood chains. However, the demand for the sawn wood and products out of the wood has been low. This can indicate an need for an even stronger market orientation, but also that the stakeholders choose to take a role as market-developers, and/or that there is a challenge to make stakeholders in the whole chain tell “the story behind the wood”; to transmit the value based brand’s unique sustainability attributes. In this case, when the unique attributes of the sawn wood are intangible, communication all the way to the consumer should be critical to promote the attributes. However, this might be problematic when only one stakeholder owns the brand, but “the story” must be told by several stakeholders in the chain, for example by retailers further away in the chain. These findings demonstrates the critical role of two-way communication, all along the chain, to support and transmit the value based attributes. Also, the importance of integration, bilingual abilities and marketing capabilities in a global value chain like this.

To create collaborations that address SD challenges, in order to build value chains that can create systemwide value, a number of stages are required. The study shows that the Curacautín chain comprises examples of all stages that are suggested as crucial for sustainable collaborations, by the sustainable partnership model. However, this study also shows an element that is not emphasised by the model; mutual sustainability values amongst the stakeholders in the chain, which appear as a critical factor to the collaborations. The result show that the stakeholders do not engage in the value chain due to a direct, high demand from their customers regarding more sustainable sourced wood. Conversely, stakeholders mention own sustainability values and/or the view of this as a CSR-project. These mutual sustainability values appear to bring patience and dedication amongst the stakeholders, which should be critical for collaborations in the chain, considering the challenges that the chain meet.

In the short term, stakeholders might engage due to a perceived benefit such as communication of a sustainability engagement, risk reduction related to sourcing and as a way to consolidate their business models. In the long term, the stakeholders appear to engage due a perceived responsibility and ambition that the collaborations shall affect the political order in the society, such as promotion of SFM and improvement of social conditions for small forest owners in the global South. Then, their engagement can be seen as a commitment to develop a market by telling “the story behind” the wood, as a perceived role of responsibility. This might bring business benefits in the long term such as a market leader position or relations that gives more business contracts. However, possible long-term benefits and the intentions to have an affect on the political order, imply a need for a perspective with a long time frame.

7.2 Recommendations for future research

There are plenty of areas related to value based and/or small-scale forest products that need to be addressed in order to increase the understanding about value chains that are built on SD concepts. Additional steps in value chain analysis, such as value chain distribution and financial analysis, are two recommendations for this chain or similar chains. Also, investigations of value chain structures of the retailer, consumer and recycling value chain stages. Comparative analysis between a greater numbers of chains of these types can help form a body of analytical contributions for theory development. Explanation of models of shared value B2B partnerships between small-scale sawn wood producers and larger forest industry companies, can further facilitate explanation of new types of value chains.

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Araya, Leonardo

Forest Engineer, CONAF

Personal meeting, 2014-11-05

Chahin Sarah, José Emilio

Former international trader of native forest, - (independent)

Personal meeting, 2014-11-12

Cheuquepan Lanera, Ruben

Forest owner/wood supplier, FSC SLIMF Group Curacautín

Personal meeting, 2014-11-07

Corrales Rodriguez, Mireja

Forest owner/wood supplier, FSC SLIMF Group Curacautín

Personal meeting, 2014-11-07

Dumas, Isabelle

Managing Director, Fair Wood Connection

Personal meeting, 2014-10-21

Dumas, Rose

Supply Chain Development Manager, FSC Sweden

Telephone, Skype, Personal meeting, 2014-09-10

Gustafsson, Inger
Sales Manager, Bovalls Dörrbyggeri AB
Personal meeting, 2014-09-30 and Skype, 2015-02-12

Hintz Inostroza, Nancy
Secretary/administrative, SSC Wood Technologies
Personal meeting, 20014-11-05

Huilcal Curinado, Juan
Forest owner/wood supplier, FSC SLIMF Group Curacautín
Personal meeting, 2014-11-18

Jarpa, Alex
Supplier Manager, SSC Wood Technologies
Personal meeting, 2014-11-04

Kaplan, Aaron
CEO, Sense Group
Telephone, E-mail, Personal meeting, 2014-09-12

Miranda, Maria Ines
Managing Director, SSC Americas
Personal meeting, 2014-10-21

Quidel Huilcal, Juan
Forest owner/wood supplier, FSC SLIMF Group Curacautín
Personal meeting, 2014-11-07

Ramon Guiñes, Felix and Flor
Forest owner/wood supplier, FSC SLIMF Group Curacautín
Personal meeting, 2014-11-17

Ruf, Thomas
General manager, RF Lumber
Personal meeting, 2014-11-14

Uhler, Bruce
Environmental Ambassador – Sustainability Manager, Kährs
Telephone, 2015-02-17

van Hensbergen, Bert
President, SSC Americas & SSC Forestry Group
Skype, 2015-04-02

Appendix 1: Interview guides

This appendix presents two of the interview guides. Additional interview guides have been used.

Interview guide - Forest Owners

Thank you for being willing to take part in an interview. I'm doing my Master's Thesis at the Swedish University of Agricultural Sciences in Sweden. The aim is to explain the development of the chain, with a focus on what makes the chain work. I'll describe the chain from the forest and you forest owners here in Curacautín, throughout the chain to the Swedish manufacturers, which procure the wood. I'm a student and this thesis project is financed by a scholarship that I've received. SSC Wood Technologies is my host here in Chile and they have approved that I'm doing this study. I want to underline that I'm not hired by anyone and that this is a thesis as part of my university education. My report will be in English and the names of you, the respondents, will be given. It will be open for everybody to read. Before we start the interview, I would like to give a short background about myself. I come from Northern Sweden, which is located in the most northern parts of Europe. My county is located in a very rural part of Sweden with few inhabitants and I grew up on the countryside, in a tiny village, on a small forest farm. At my university program, I've been studying business management and forestry. Therefore I'm interested in forest SMEs and if/how it is possible to increase the income, in combination with sustainable forest management. My Spanish is unfortunately not so good. Therefore I've Camila here, which is an interpreter, to help me. I'll take notes and record our talk, as support for my memory. In the end of the interview, I'll re-iterate the main features of what I've perceived as your answers to my questions, to check that I get the facts right. Is it anything you wonder about practicalities, before we start?

General – background

1. Please tell me shortly about your own background?
(Name, age, family, original residence)
2. What is your main income/s?
E.g. employed – what type of work? Livestock, crops, forestry, artisans etc.
3. Shortly about your land?
(Size of the native forests in hectares, where is the land located, owner to the land, Y/N what kind of lease, start to manage the land, how come that you became the owner/leaser)

Value chain and supply chain aspects

4. Can you in a few sentences describe how you carry out harvest, thinning and regeneration?
 - a. Do you do it yourself, method, replantation by self-regeneration or by plants, age of cutting, usual cutting area size, how often
5. The timber that you sell to SSC, do you practice different forest operations for this timber, compared to timber that you sell to other companies? Like: grow it in a special way (Y/N)
 - a. If yes; what are the biggest differences in the management?
6. Why do you choose to sell your wood to SSC WT? (... anything more)
7. The first time you sold wood to SSC WT, why did you choose them initially?
8. What is important for you in the relation with a timber purchasing company?
 - a. What do you value in the relation with SSC WT?
9. What do you think about SSC WT?
(PICTURE WITH A SCALE)

Value based/sustainable supply chains

10. When you manage the forest, what is important for you? Mention two or more things. (... anything more)
(THE EXAMPLES ARE VISUALISED AT A BOARD)

# As high wood production as possible	# To earn as much as possible on wood
# To have it as pasture land for livestock	# To care for wild animals
# To care for different plants	# To grow as fast as possible
# I don't think anything special is important	# To grow for as good quality as possible
# To care for the forest so some other person/children can take over it, some day	
# To be able to use or earn money on mushrooms, berries or other resources	
# Other things?	
11. What is the price that you get paid/receive for the logs? (per m3)
12. If you would estimate, how much do you think that it costs you to produce one m3 or pulgada of wood?
 - a. What do you estimate that you profit is?

Enabling and constraining factors

13. Would you like to sell more wood to commercial justo and FSC-companies? Y/N
 - a. If yes, what are the reasons to why you don't produce and sell more to commercial justo and FSC companies?
 - b. If no, why not?
14. Would you like to develop your forest operations more? Y/N
 - a. If yes, what do you need in order to do so?
 - b. If no, why not?
15. How do you think you could earn more on your forest?
 - a. What do you need to carry out that?
16. In five years, what do you plan to do with your forest?
 - a. Why?
17. Reasons to why you would choose to not sell wood to SSC in the future?
18. Have you attended to training/courses, regarding forest operations or work in the forest, and if so, what were they about?
 - a. Would you like to learn more about forest management?
19. Can I have access to the management plan?
20. Can I finally ask you if you think there is anything that you would like to add that I have not asked you?

I'll now go through my main notes and shortly mention what I noted as the main answers. Please comment, if you think that I perceived any of your answers wrong. Finally, I wonder if it is possible that I can come back to you by phone or meeting, if I discover that there is anything more I need to ask you. Thank you very much for helping me and giving up your time!

Reconfirming/support questions:

¿Algo más?

Puede dar unos ejemplos

¿He entendido bien cuando usted dijo?

¿Cuál es tu opinión personal sobre esto?

Interview guide – Procurement manager SSC WT

General – background

1. Please tell me shortly about your own background?
(Name, education, titles in previous work, current residence, original residence, title and role at Fair Wood Connection, started to work at Fair Wood Connection)

Value chain and supply chain aspects

2. How would you describe SSC Wood Technologies role in the chain?
 - a. What are the most important functions of SSC Wood Technologies?
 - b. Who are working in SSC Wood Technologies?
3. How would you describe the role of the SLIMF group/the forest association?
 - a. Who is the chairman?
 - b. How often do the group meet?
 - c. What are the most important functions of the group?
4. Please tell me *shortly* about the main features in the forest management and operations.
 - a. Harvest?
(How; age/diameter, withdrawal in volume/hectare, harvesting method, species, machines, pruning and delimbing, landings, who pays and carries out the operations, environmental considerations, environmental scheme/protocol, FSC and/or Fairtrade considerations)
 - b. Regeneration?
(How; replanting, natural, land preparation, what kind of plants, plants/hectare, provenience, operations carried out by)
 - c. Thinnings? (briefly)
(How; are the forest stands thinned, how, when, net cost or revenue)
 - d. Transportation?
(Type, who pays and carries out)
5. Is the forest managed differently, depending on what it might be used to in the chain?
6. How do you communicate with the forest owners?
7. How often do you meet them?

8. How do you place the orders of the wood, to the forest owners?
9. Is it possible to track each sawn wood (e.g. after the sawmill), to each forest owner?
10. What is the price paid to the forest owners?
 - a. Is the same price paid to all owners?
 - b. Does the payment go via the forest association, or directly from SSC Wood T?
 - c. How is the price paid to the owners agreed/decided?
 - d. What is the estimated cost for harvest (for example per hectare)?
 - e. What is the estimated cost for the rest of all the other forest operations?
11. What is the cost for the sawmill?
 - a. Who pays the sawmill?
 - b. Do you have contact with the manager of the sawmill?
12. Where in the chain/by whom, do you think that the most important decisions taken?
 - a. Why?
13. Who are the most important persons or organisations in the chain, according to your opinion?
 - a. Why?
14. Who do you think, have the most influence over the chain? One or more stakeholders (persons) in the chain.
 - a. Why?
15. With whom do you discuss different concerns and problems with, regarding the operations of SSC WT?
16. What do you know about your Swedish customers? (what is the wood used for)

Value based/sustainable supply chains

17. What is the business idea of SSC W T?
18. What are the most important characteristics of the wood that you sell?
19. What do you consider as environmental and social considerations?
20. Do you think that it is a larger share of one gender represented among the forest owners in the FSC group?
 - a. If so, how do you work to address the least represented gender?

Enabling and constraining factors

21. Now I will ask you questions about what you have perceived as problematic, in the work with the chain and/or to make the chain functioning.
 - a. What do you perceive as critical, to make the chain function? (earlier, now)
 - b. What have the problems been, with FWC? Please mention at least three-four different things.
 - c. What has been easy? Please mention at least three-four different things.
 - d. What do you believe is important, to make the chain function?
 - e. (SWOT –EXERCISE) Now I would like to ask, what you spontaneously think about four different categories; strengths, weaknesses, opportunities and threats for the chain. I will mention the category and to each category, please respond what first comes up to your mind, spontaneously, regarding FWC
 - f. (THE WORD GAME). I would like you to freely choose the statements that you have encountered in your work with FWC, or that you think is especially important in the work with developing the chain. There are some white papers. If you feel that you think of anything that can't be found on the already written notes, please write what you think about at the blank papers. Please motivate why you think each statement that you choose, are important.
22. Can I finally ask you if you think there are anything that you would like to add, that I have not asked about?

Thank you very much for your answers. I'll now go through my main notes and shortly mention what I noted as the main answers. Please comment, if you think that I describe any of your answers wrong. Finally, I wonder if it's possible that I can come back to you, if I discover that there's anything more I need to ask? Thank you very much for helping me, for answering the questions and giving of your time!

Reconfirming/support questions:

¿Algo más?

Puede dar unos ejemplos

¿He entendido bien cuando usted dijo ...?

¿Cuál es tu opinión personal sobre esto?

Appendix 2: SFM, governance determinants and forest products supply chains

In this appendix, further information is presented regarding SFM and determinants of global value chain governance. Also, a generic description of forest products supply chains is given.

A.2.1 Sustainable forest management

One of the main problems with SFM according to Van Dijk & Savenije (2009) is that the income from the use of or from the conservation of forests, not is enough to constitute sufficient incentives to implement SFM. Forest management based on SFM-principles often fails to be competitive and capable to attract investors, which cause lack of financial capacity. A main problem to this is an undervaluation by the society of the multiple functions of forests (*ibid.*). Without enough financial incentives and enough return for SFM, other land uses are often more competitive. With other words, if the returns of other land uses are higher than the return of SFM, there are less financial incentives for forest owners to keep the forest and practice SFM. Instead, unsustainable or illegal harvesting, agriculture, mining or livestock might be practiced to generate sufficient livelihood, and/or to give a higher return on a financial investment (*ibid.*). Other problems that hinder the practice of SFM are the view of wood as the sole asset which can come from forests, not properly incorporate management costs in the accounting sheets, unequal distributed costs and benefits along value chains, the long-term nature of forest activities and complex biological, financial, regulatory and political aspects (*ibid.*). Also, SFM suffers from competition by illegal logging and subsidies or tax incentives that might favour other land use.

A.2.2 Key determinants of global value chain governance

Figure 11 shows a table presented by Gereffi et al. (2006, 87) for determination of global value chain governance. To the left, the five governance types are found. By using the result of the analysis regarding the key determinants, the schedule can help identify which type of governance that a chain might have.

Table 1 Key determinants of global value chain governance

Governance type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low
Modular	High	High	High	↕
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	High

Figure 11. Key determinants of global value chain governance (Gereffi et al., 2006, 87).

A.2.3 Forest products supply chains

To start with, it can be concluded that forest products supply chains are exceedingly complex (Haartveit *et al.*, 2004; Vahid & Maness, 2010). They are similar to other supply chains in the aspect of the typical flow from producer, to manufacturers, distributors and end consumers (Shahi & Pulkki, 2013). However, a characteristic that signifies and complicates the forest products supply chains is the numbers of stakeholders affecting the chain, which includes local communities, governmental agencies and non-governmental organisations, among other stakeholders (Vahid & Maness, 2010). The forest production is very visible with the growing of trees and the harvesting of them (Vahid & Maness, 2010; Roberts, 2003). Another characteristic is the *disassembly* of raw material, unlike other conventional chains where the chains often only

include assembly different materials (Shahi & Pulkki, 2013). A whole forest product supply chain does often include a range of different material flows with divergent flows in the “breakdown operations” of the timber, to assembling flows in the production of for example furniture or floors (Haartveit *et al.*, 2004). Moreover, properties of wood are heterogeneous, which complicates the production and manufacturing of wood products (Shahi & Pulkki, 2013). The management of the forest can affect the wood characteristics, which in turn affect the production, quality and what the wood is most suitable to use for. This means that the raw-material supply is uncertain and with variation in quality.

It is usually described that the supply chain of forest products starts with the harvesting, bucking and pruning of logs in the forests (Shahi & Pulkki, 2013; Vahid & Maness, 2010). Depending on the location, region, forest owner and/or the stakeholder that performs the harvesting; different methods are used. In a European or North-American setting, a harvester is usually used for harvesting of the logs and a forwarder is used to bring out the logs via side tracks to the storage area (Vahid & Maness, 2010). From the storage area the logs are later transported to sawmills, pulp mills, wood chips factories, bioenergy plants or other facilities (Shahi & Pulkki, 2013). Typical modes of transportations are truck, train or by ship, depending of the terrain and proximity to different infrastructure (*ibid.*).

Depending on which kind of manufacturer the logs go to, different processes take by. Focusing at the sawmill supply chain; a very simplified description of the process is that the logs are sorted, measured, screened and cut into final products. A residue from the process is wood chips, which is sold to pulp mills or bio-energy plants (*ibid.*). The logs are then dried in kilns to certain moisture contents, to match specific products requirements. Further processes that take place are for instance lamination, jointing, impregnation and production of hybrid construction materials, veneering or bio-composite materials. From the sawmills, the sawn wood proceed to a) further secondary production facilities, where the sawn wood are used to produce for instance furniture, floors or windows produced b) or directly “out” to traders. Products from both a) and b) proceed via a network of distributors and retailers, to finally reach the end-consumers.

Several studies, such as Shahi & Pulkki (2013) and Haartveit *et al.* (2004), state that flows and processes in forest products supply chains mainly are driven by push-processes, rather than pull-processes. The production- and commodity-focus is one reason, but also the complicated chains as well as the range of different products that are produced at each stage. The high share of raw material cost out of the total production cost, is another explanation to the production focus (Hansen *et al.*, 2014). The raw material costs constitutes around 70 % of the production cost (Hansen *et al.*, 2014, 4). As an example, out of one mature tree in the Canadian forest industry is only approximately 17 % of the tree used to sawn wood (Shahi & Pulkki, 2013).

In order to improve competitiveness, there is an urge to move from the traditional low-cost production focus in the forest industry, to a more value-based focus. Shahi & Pulkki (2013) mean that a the current push-supply chain model of Canadian forest industry does not incorporate market demand signals and has a restricted information flow. They suggest a two way modelling of information flow, to coordinate and optimize upwards operations such as the forest management, with downstream operations in the chain. Hansen *et al.* (2014) also state that the low-cost production focus in the forest industry, has create a blinder for a consumer- and demand focus; which is now needed to develop the value creation in the forest industry.

Appendix 3: Background empirics

This appendix gives a short presentation to the forest sector in Chile, characteristics of the tree species used in the Curacautín value chain, the FSC- and Fairtrade dual labelling pilot project as well as empirical results regarding the price of timber and sawn wood in the Curacautín value chain.

A.3.1 The forest sector in Chile

The forest sector in Chile has a divided present and a divided past; into forest plantations and native forests (pers. mes., Araya, 2014). The two forest types are characterized by big differences. The plantation industry has been promoted by forest legislation and subsidies during different periods of the 20's Century. The native forest on other hand, is not managed very active and it is often in bad conditions (pers. mes., Araya, 2014; pers. mes., Chahin, 2014). Araya (pers. mes., 2014), a forest engineer at CONAF and Jarpa (pers. mes., 2014), wood procurement manager for SSC WT, mean that there is little national focus towards sustainable management of native forests and also sawmill and drying production processes concerning native forest wood species.

Globally, Chile was the ninth biggest exporter of pulp, paper and sawn wood products in the world during 2013 (Skogsindustrierna, Internet, 1, 2014). Pulp constituted the biggest share of Chile's total export of pulp, paper and sawn wood. This placed Chile as the forth-biggest exporter of pulp in the world during 2013 (*ibid.*). The total forest area in the country is 16,2 millions of hectares, which constitutes 22 % of the country's total land area (McGinley *et al.*, 2013). Plantations account for 15 % of the forest cover (*ibid.*). Forest ownership is distributed with 25 % as public owned and 75 % as private owned (*ibid.*). In the latter half of the last decade, the forest industry in Chile generated about 3 % of the country's gross domestic product and constituted 7,3 % of Chile's total export (Maturana *et al.*, 2010). The net change of forest cover in Chile is positive, with 0,23 % of annual growth of the forest cover between 2005-2010 (McGinley *et al.*, 2013). However, exotic species account for 99 % of the afforestation in South America as well as 98 % of the reforestation in South America (FAO Global Forest Resource Assessment, 2010, 97-99).

According to FAO Global Forest Resource Assessment 2010, a specific forest law was implemented in Chile in 1974 (FAO Global Forest Resource Assessment 2010, 303). Chile does not have any national forest programme or a national forest policy (*ibid.*). In 2008, a specific law concerning native forest management was implemented after many years of discussion. The name of the law is Ley Sobre Recuperación del Bosque Nativo y de Fomento Forestal, and the objectives of the law is to protect, recover and improve the native forests in Chile (Real & Hickey, 2013).

A.3.2 Characteristics of the tree species in the Curacautín value chain

The county of Curacautín has an area of 174 007 hectares and had a population of 16 970 persons in 2002 (CONAF Curacautín, N/D). Out of the 174 007 hectares, 53 % of the land area is covered by native forests (*ibid.*). Mixed forest stands are common, with Coihue as the most common species in the forest stands, followed by Raulí and then Roble. Raulí and Roble are also the species that are used in the Curacautín value chain and they are presented further in the next paragraph. Approximately, a Raulí of 25 metres height and 50 centimetres in diameter requires 55 years to grow to mentioned dimensions (CONAF Curacautín, N/D). Also, an approximation is that an average growth for Raulí is five cubic metres per hectare and year (*ibid.*). This does however vary significant, depending on the growth site (pers. mes., Jarpa,

2014). Furthermore, with an improved silviculture of the native forest stands, Hensbergen (pers. mes., 2015) which is co-founder of SSC WT and SSC A, means that it is possible to reach a growth of ten cubic metres per hectare per year. Araya (pers. mes., 2015), forest engineer at CONAF in Curacautín, says that the productivity of the native forests are 10 % out of what it could be in the region of Curacautín, due to lack of forest management.

The tree species that are used for sawn wood in the Curacautín chain are two hardwood species; Roble (*Nothofagus Obliqua*) and Raulí (*Nothofagus Alpina*). Both of them are native Chilean species (pers. mes., Araya, 2014), which grow in tempered climate zones in Chile (Donoso *et al.*, 2013; Ojeda *et al.*, 2013). The species are deciduous and grow in pure or mixed forest stands, from about 100-900 metres of elevation (Echevarría & Lara, 2004). Also, they prefer deep, well-drained soils. Compared to other forest types, the two species are characterised by a relatively rapid growth rate. The wood of both species is considered of high quality, for furniture use, building and handicrafts (*ibid.*). These two species, together with other native forest species, are internationally recognized for their ecological significance and the cool, temperate rainforests in Chile are the second-largest remaining area in the world (Real & Hickey, 2013). However, severe overexploitation of forests in south-central Chile has led to degradation of the native forests, including these two species (Donoso *et al.*, 2013). Change of land use, which causes deforestation, is a major threat against many of the native forests in Chile (Real & Hickey, 2013).

Nothofagus Obliqua, Roble, has dense foliage, can reach up to 50 metres in height and up to two metres in diameter (Ojeda *et al.*, 2013). It prefers low Mediterranean climate zones, with deep, fertile soils. The wood from *Nothofagus Obliqua* is according to Ojeda *et al.* (2013) of excellent quality to be used for instance to boats, piers, sleepers, poles and furniture. It is also good to use for example roofs, structures, windows, doors, external coating and plywood. The wood has a soft red tone with pale yellow elements.

Nothofagus Alpina, Rauli, can reach up to 50 metres in height and a diameter of about two metres (García & Ormazabal, 2008). The species prefers growth sites with slopes and some shade and it inhabits the Andes in south-central Chile. It is relatively wind resistant and it is the fastest growing species in the Chilean *Nothofagus* family (*ibid.*). Previously, it has been extensively exploited and today remains mostly second growth or third growth generations. The wood has a red tone and the knots are often symmetrical and even spread (*ibid.*).

A.3.3 FSC- and Fairtrade dual labelling pilot project

The FSC- and Fairtrade dual labelling pilot project is a project that was run between 2009-2013 by the certification organizations FSC and FLO (FSC, Internet, 1, 2015). The project concerned dual labelling of forest products from small forest owners and community based forests, with both the FSC and Fairtrade label in order to help facilitate an increased market access (*ibid.*). Among other things, it has shown that FSC, even if it includes some social aspects in the standard, has failed to distinguish SMFEs products from other forest products (Macqueen, 2008), for example from multinational corporations. Karmann *et al.* (2009, 1), representing FSC, stated in 2009 “*the expectations about FSC’s uptake in tropical and low intensity forest management, by small forest owners and by communities have not been completely fulfilled*”. The combination of FSC and Fairtrade labelling has not been practiced before on wood products and the pilot project was therefore initiated (FSC, Internet, 1, 2014). In the pilot, the Curacautín value chain was one of the pilot chains, together with for example a small-scale forest operation in Honduras and a small-scale timber producer in Bolivia. The requirement from the project was that the producers were “*community, small, or low-intensity timber*

operations in developing countries that were already FSC certified” (ibid.) and that the retailers were located in Europe. Potential benefits of the dual certification for small forest owners are minimum prices and guaranteed price premiums. The minimum price is calculated on basis of the producers “costs of sustainable production” and aims to ensure that *“the producers receive a fair and stable prices for their products”* (Fairtrade, Internet, 2, 2015). The Fairtrade Premium is an additional sum of money that the producers receive out of the market price of the products. The premium goes to a local fund that the producers can use. Due to the variety of timber products, the premium in wood products chains is a minimum percentage which should be *“high enough to bring significant benefits to the producer, without making the retail price to be too high to be competitive”*, according to Fairtrade (Fairtrade, Internet, 2, 2015). The Fairtrade premium in the Curacautín chain is according to a stakeholder in the chain 10 % out of the market price/the price out to the secondary manufacturers (pers. mes., van Hensbergen, 2015).

A.3.4 Price of round wood, Fairtrade premium and price of sawn wood

The price paid per volume to the forest owners from the wood procuring company SSC WT is according to the wood procurement manager at SSC WT the same amount to all owners, 2000 Chilean Pesos (CLP) for one *pulgada*¹¹ (pers. mes., Jarpa, 2014; Etchegaray & Barrios, 2013). Given that one cubic metre of timber is equal to 22 pulgadas according to the Donat-scale, the price paid to the forest owners is around 40 000 CLP/m³ timber (*ibid.*), which is about 64 USD¹²/m³ timber, the premium and tax not included.

Van Hensbergen (pers. mes., 2015), co-founder of SSC WT, mentions that SSC WT pays a price at around 80 USD/m³ round wood. The forest owners in the FSC SLIMF group Curacautín were also asked about which payment they received per volume for the timber. Three of the forest owners mention 2 000 CLP/pulgada, one mention 2 200 CLP/pulgada and another 2 500 CLP/pulgada for Raulí (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014; pers. mes., Quidel, 2014; pers. mes., Corrales, 2014; pers. mes., Ramon, 2014). The difference might depend on that some forest owners might include the premium in the price, due to that they gave an answer to a question regarding which price they received per volume from SSC WT. Corrales (pers. mes., 2014), VC of the FSC SLIMF group Curacautín, says that the price paid to the forest owners is “set” by SSC WT and that the price of the wood is equal to all forest owners. The forest owners do not negotiate together in a group and they do not have tradition of doing so, either. When the forest owners answer the question regarding which payment they receive for the timber, some mention that the payment from SSC WT is higher than the payment from other procurement companies (pers. mes., Corrales, 2014) and that they think the price is fair (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014). One of the forest owners means that he can receive a higher price if he dries the timber and sells the wood as fire wood or sawn wood to other companies, such as 4500 CLP/pulgada sawn wood (pers. mes., Huilcal, 2014). Ramon (pers. mes., 2014) means that they can get paid 3 000 CLP/pulgada from other companies, but then the logs are longer than the logs SSC WT buys. They wish to sell more to SSC WT and for example Huilcal says (pers. mes., 2014) *“SSC WT is a good company”*. As presented in the result, the forest owners say they value the trust in the relation with SSC WT. Also, they appreciate the fair trade model and mean that the premium perhaps not is that big now when the production is in small volumes, but the percentage share give the opportunity to larger premiums in the future, if SSC WT can increase the production and sales (pers. mes., Cheuquepan, 2014; pers. mes., Huilcal, 2014). They hold trust and transparency high in a

¹¹ One pulgada means a wooden board with one inch thickness, ten inch width and 12 feet length (pers. mes., Chahin, 2014).

¹² Exchange rate 2015-05-28 CLP to USD at xe.net.

relation with a wood procurement company (pers. mes., Quidel, 2014; pers. mes., Cheuquepan, 2014).

The Fairtrade premium implies that an additional 10 % on the price of the sawn wood out to the secondary manufacturers is charged (pers. mes., van Hensbergen, 2015). This sum is distributed among all stakeholders that have been involved in the production (pers. mes., Hintz, 2014). About 30 % of the premium goes via a local fund to stakeholders in the local community (pers. mes., van Hensbergen, 2015), such as the forest owners or the personnel at SSC WT (pers. mes., Jarpa, 2014). During the interviews with the forest owners, when an additional question was posed regarding what premium they had received, the most forest owners did not remember for sure. Corrales (pers. mes., 2014) mentioned that she had received 80 000 CLP one time and 50 000 CLP another time, which is about 128 USD respectively 80 USD¹³. Cheuquepan (pers. mes., 2014) states that he harvests and sells about 200-250 pulgadas in one delivery and the last premium was 40 000 CLP. According to Corrales (pers. mes., 2014), VC of the local FSC SLIMF group in Curacautín, the Fairtrade premium to the forest owners is managed by the local FSC SLIMF group which approve requests regarding the use of the premium. The forest owner must state what he/she plans to do with the premium and the group does then approve this. So far, each forest owners have used their own premium, but they have had thoughts regarding buying for example a mini bus, to drive the children to school and also to use as a mini bus service, to create an extra income. The local fund has access to invoices and receipts from the customers further away in the chain (pers. mes., Corrales, 2014) on which payment the premium is calculated.

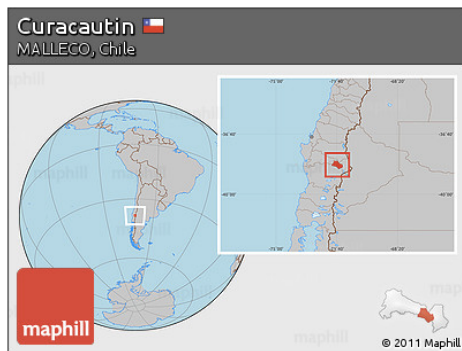
Regarding price for the sawn wood out to the secondary manufacturers, an economical evaluation of SSC WT from 2013 states that the average price was 1 087 USD/m³ (Etchegaray & Barrios, 2013). Bovalls dörrbyggeri (pers. mes., Gustafsson, 2015) says that a price around 1 000 USD/m³ has been mentioned to them and one of the co-founders mentions a price around 900 USD/m³ (pers. mes., van Hensbergen, 2015).

The retailer and consumer stage are not included in the scope of this study; the study is delimited to the first stages in the value chain. However, approximate prices are mentioned here, solely to give an idea regarding the price of the products in relation to other products that not contains FSC- and Fairtrade wood, from the same producers. While comparing prices of the Cautín floor to prices of other floors from Kährs at a retailer Internet shop, the listed price of the Cautín colorations Roja and Piedra is 107 USD¹⁴/m² (Bjoorn, Internet, 1, 2015). Floors from Kährs with other wood species, 2-tile, 15 mm, have prices from 52 USD/m² up to 124 USD/m² at the same Internet retailer (*ibid.*). Bovalls dörrbyggeri estimate that if they will produce doors with panels out of wood from Curacautín, the price of the door will be about the same price as for a door with oak panel. The price will also be about the same as what they take for a door with small-scale produced, FSC-labelled Freijo from Brazil (pers. mes., Gustafsson, 2015).

¹³ Corrales (pers. mes., 2014) did not spontaneously remember the volumes related to these premiums.

¹⁴ Exchange rate 2015-05-29 SEK to USD at xe.net.

Appendix 4: Photos



*The region of Curacautín in Chile
(© Maphill / CC BY-ND).*



The valley of Curacautín (photo: Frida Magnusson).



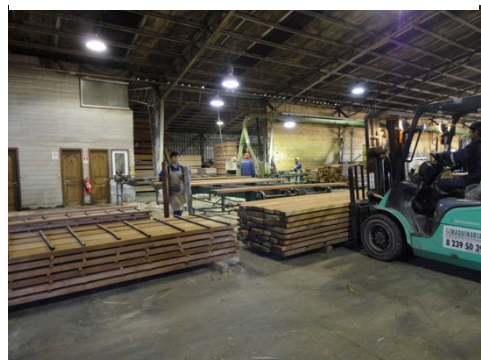
Flor Ramon Guiñes, forest owner in FSC SLIMF group Curacautín (photo: Frida Magnusson).



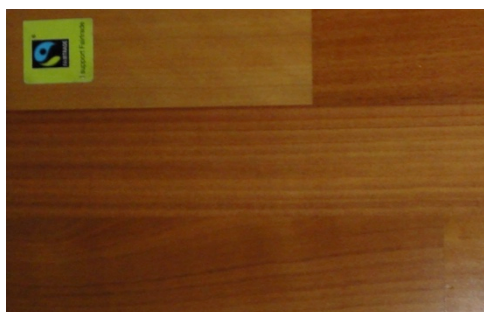
Deforested hill as a result of livestock keeping (photo: Leonardo Araya, CONAF).



Forest stand belonging to a forest owner in the FSC SLIMF group Curacautín (photo: Frida Magnusson).



The sawmill RF Lumber, where the sawing and drying is outsourced (photo: Frida Magnusson).



Cautin, floor from Kährs with top coat wood from Curacautín (photo: Frida Magnusson).



One of the colourings of Kährs' Cautin floor, in FSC Sweden's office (photo: Märta Lindqvist, FSC).